Creating the Ontario Biodiversity Strategy

Ontario Biodiversity Strategy (OBS)
Strategie sur la biodiversité de l'Ontario (SBO)

Workbook #1

Message from the Minister

The Ontario government is committed to developing an Ontario Biodiversity Strategy that will help us meet our national and global responsibilities for biodiversity conservation and contribute to the sustainable use of our province's biological resources. I invite you to participate in developing that strategy through this workbook.

Canada was the first industrialized country to ratify the 1992 United Nations Convention on Biological Diversity. In 1996, the Canadian Biodiversity Strategy was approved by federal, provincial and territorial governments. The national strategy defines biodiversity as "the variability among all living organisms, including diversity within species, between species and of ecosystems." Biodiversity is the web of life.

The Canadian Biodiversity Strategy invites all Canadians to join in conserving our country's biodiversity and using our biological resources in a sustainable manner. The agreement also calls upon each provincial and territorial government to develop its own approach to implementing the Canadian strategy.

Ontario is blessed with a rich natural heritage, and we owe it to all Ontarians, present and future, to protect the variety of species and ecosystems that make up that heritage. We have a responsibility to conserve biodiversity and use our biological resources in a sustainable way. Whatever we can do to maintain the diversity of plant life, animals and ecosystems will make our province stronger and improve our quality of life.

The Ministry of Natural Resources has invited representatives of environmental, industry, municipalities, aboriginal and other groups, as well as senior staff from other provincial agencies, to work with us in an open, inclusive and transparent process to develop the strategy. This workbook has been designed to stimulate discussion and get that process under way. The workbook will be used in meetings with our partners and will be available on-line at www.obs-sbo.ca so that everyone can provide ideas and comments.

An Ontario biodiversity strategy will be an important guide for developing programs and policies related to biological resources. It will also be a useful framework for a range of current initiatives, including protecting green space, halting the spread of invasive species, protecting species at risk and reviewing our parks and protected areas legislation. It will support similar efforts to conserve biodiversity by Ontario industries, stakeholders and the public. The strategy will also identify gaps in what we're doing now and highlight priorities for action over the next five years. It will help us all to stop, think and act in defense of the web of life that sustains us.

Conserving biodiversity will contribute to a healthy environment, strong communities and a prosperous economy. It's a shared responsibility for all Ontarians. I encourage everyone to take part in the development of the Ontario biodiversity strategy.

David Ramsay
Minister of Natural Resources

Toronto, Ontario
November 2004

105-04395/

Facilitator's Foreword...

My Assignment

I have been retained by the Ministry of Natural Resources to design and facilitate an open and transparent consultation process that produces a consensus-based Biodiversity Strategy for Ontario. The Minister's welcoming remarks in this document indicate the he sees the process and the resulting document as a strategy for all Ontarians, not just for MNR or for the Ontario government. It is also clear that we need to be focused on what we need to do, and can do, together in the next five years. In order to realize this vision, Dr. Jim MacLean (who leads this project for MNR) and I have defined my role in the following ways:

Role: ..... The role of the independent facilitator is to enhance the public /stakeholders participation in the decision making process and to assist the decision-makers in being responsive to the public /stakeholder concerns and suggestions about biodiversity.

Trust: ..... The independent facilitator will at all times encourage actions that build trust and credibility for the process and among the participants.

Openness: ..... Information relevant to the public's understanding or evaluation of a decision will be disclosed and made available on the project web site.

Access: ..... All stakeholders will have the opportunity to take part in the planning process.

Respect for all: .....The independent facilitator will avoid approaches that could polarize community interests or appear to divide and conquer.

Commitments: ..... The independent facilitator has a responsibility to ensure that commitments made to the public are genuine and capable of implementation.

Who is Robb Ogilvie?

I am an independent facilitator who, for the past 26 years, has developed a consulting practice based on conflict resolution and consensus development approaches to thorny public policy issues, visioning processes, scientific and technical problem solving and change management. I am always concerned with respecting all viewpoints and I am usually able to get people with divergent viewpoints to sit down and reason together. I am also a former public servant who worked for the provinces of Ontario and New Brunswick for 10 years, prior to establishing my own consulting practice in 1978. A copy of my resume will be made available to anyone who asks.

The Public Consultation Process

The public consultation process has been designed with the following assumptions and features:

The primary challenge is to "just do it". There has been enough discussion over the last decade about biodiversity that we think it is now time to get everyone involved and see if we can develop a consensus-based strategy that leverages our collective resources.

Therefore, we think we can/ should build on the work and reports that have already been done and avoid unnecessarily re-inventing the wheel.

As such, this document, uses extracts from various reports as "discussion starters". This does NOT mean that any decisions have been made. Nothing is carved in stone at this point in time. The reason for including them is to build on what has been done first, stimulate reactions, and see where we should be thinking "outside the box".

In order to have a Biodiversity Strategy ready in the Spring of 2005, we have to fast-track the creation of "DRAFT" materials for people to start reviewing, revising, and discussing. We realize that we are taking a risk that some stakeholders may think everything is pre-determined. However, we hope that as everyone sees how things unfold and as people see the process is truly transparent, that any initial concerns will fall by the wayside.

The WORKBOOK

This is just the start of the public consultation process. This 1st consultation document is called a "WORKBOOK" because it is intended to be just that - it is NOT the 1st draft of the strategy. Rather than wait for the drafting teams and reviewers to produce a 1st draft, Dr. MacLean and his Team have assembled this WORKBOOK as a discussion starter with sample quotes and extracts from the Canadian Biodiversity Strategy, the New Zealand Strategy, the Saskatchewan Biodiversity Strategy, etc., solely to stimulate reactions as food for thought about what you want in an Ontario Strategy. As you review each section, the following questions have been included for your consideration and reactions:

- *What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?*
- *What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?*
- *What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?*
- *What actions do you recommend that the Strategy identify in this topic area for Ontarians to focus their efforts on, and especially what should the focus of actions be over the next five years?*
- *Are there any other topics that were not included in this first workbook that you recommend be addressed in the proposed Ontario Biodiversity Strategy? If so, please provide any initial advice on the topic's: scope; major challenges, issues and/or opportunities; goals/objective/strategies; and actions?*
- *Do you have any other comments or suggestions?*

The WORKBOOK consists of two (2) Parts:

Part 1 - Materials to be used to craft the sections on Threats, Vision, Goals and Principles for a Biodiversity Strategy for Ontario
Part 2 - Materials to be used to craft the sections on Strategic Directions and Actions. These materials have been broken down into the following topic areas:

- Conservation
  - Protected Areas
  - Species and Ecosystem Recovery
  - Invasive Species
- Sustainable Use of Biological Resources
  - Sustainable Use of Aquatic Ecosystems
  - Sustainable Forest Management
  - Sustainable Use of Wild life
  - Sustainable Agriculture
  - Human Population and Settlement
  - Genetic Resources
- Supporting Strategies
  - Traditional Knowledge, Science and Information
  - Education and Awareness
  - Incentives and Legislation
- Implementation

The WORKBOOK will be replaced after Christmas with the 1st DRAFT Strategy

It will be followed after Christmas with a "Draft Strategy" based on your reactions to Part 1 and your suggestions for Part 2. We are using an iterative process of preparing successive drafts of a possible strategy and seeking public input at each stage in its evolution. This special web site (www.OBS-SBO.ca) will provide you with an ongoing portal into the evolution of the draft strategy documents.

Confidentiality and Attribution

On the Ontario Biodiversity web site you will be able to respond to the questions posed in the WORKBOOK, make comments on drafts of the strategy as they go through several versions, as well as provide your thoughts, questions and concerns on any topic related to development of this strategy. This web site is one way to engage the public/stakeholders in a conversation that is open and visible to everyone. Therefore comments submitted through the site will be posted for others to see and comment on. We may, for purposes of length and clarity, edit these comments.

We encourage you to identify yourself and your organizational affiliation if you are speaking on their behalf. We will also ask for contact information and whether you are a resident of Ontario. You will not be required to provide any of this information—it is totally a voluntary matter, but it will help us get a better sense of where participants stand. If you do provide us your name and organizational affiliation you will have the choice as to whether that information is published along with your comment. You may choose to have your comments published anonymously.

All information we collect is subject to strict privacy policies and is governed by law, specifically the Freedom of Information and Protection of Privacy Act (FIPPA). This legislation contains specific provisions about the collection, storage and use of information collected and recognizes the right of individuals to have that information protected and disclosed to them

We treat your information with care. We will not share or otherwise provide any personal information to anyone not associated with the project. We will not post any personal information on this website unless we receive explicit authorization from you to do so. We may use the information to produce summary information that cannot be used to identify specific individuals. Our privacy policy is available on the web site.

How do I comment and what happens to my comments?

There are several places on the website where you can provide your comments. You do so by filling in a form on the site. You may submit as many comments as you wish, on any topic, workbook or draft that is part of the process to develop the strategy.

Your comments are reviewed by our team and posted on the site for others to see and comment on. You will have the option of having your name and organizational affiliation included with your comments. Your comments will be available to all teams preparing the strategy and they will be considered seriously in producing successive drafts of the strategy.

Will I see the draft strategy documents? When? Will I have further opportunities to make my views and opinions known?

All drafts of the strategy, as well as background documents and information, will be added to the site as soon as they become available. You will have the opportunity to comment on drafts and you will always be able to provide comments on any topic related to Ontario's Biodiversity Strategy.

In closing, I hope this helps answer some of the questions on your mind. If you have any other questions, please do not hesitate to send me an e-mail and I will try to get back to you within 24 hours. And if you have a complaint, please give me 1st shot at fixing the problem before you complain to anyone else.

Cheers

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Comments and personal information submitted regarding the proposed Ontario Biodiversity Strategy are collected under the authority of the Public Lands Act, the Fish and Wildlife Conservation Act and the Provincial Parks Act to assist in the development of the proposed Ontario Biodiversity Strategy. Comments and opinions which do not constitute personal information, as defined by the Freedom of Information and Protection of Privacy Act, will be shared among MNR, MNR's project facilitator, other ministries involved, and individual experts who are assisting in the preparation of the Strategy as writers and/or reviewers; and may be included in Strategy development documentation that is made available for public review. Personal information will remain confidential unless prior consent to disclose is obtained. For more information about this project, please contact MNR: Dave Gordon at (416) 314-1941, or alternatively, Jim MacLean at (416) 314-7305.

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Part 1 - "Where do we want to go?"

1.0 Introduction

The purpose of Part 1 of this workbook is to provide you with some initial information about biodiversity: a short summary of Ontario's biodiversity; world-wide threats to biodiversity; and a number of potential vision, goal and principle statements.

In the late 20th century, people around the world realized that biological resources have limits, and that we are exceeding those limits with a consequent reduction in biological diversity (McNeely et al., 1990). In response threats to the Earth's biological diversity, the 1992 United Nations Conference on Environment and Development prepared the Convention on Biological Diversity (UNEP, 1994). The Convention is focused on the conservation, sustainable use, and equitable sharing of earth's biological assets.

Canada was the first industrialized nation to ratify the Convention, and in 1995 published the Canadian Biodiversity Strategy (Environment Canada, 1995), which was approved by federal, provincial and territorial Ministers. Since 1995, numerous agencies, organizations, institutions, and companies in Ontario have completed work in response to the Canadian Biodiversity Strategy. This proposed Ontario Biodiversity Strategy will provide a framework for conserving Ontario's biodiversity and sustainably using the province's biological resources over the long term and, most importantly, an action plan to guide implementation in Ontario over the next five years.

Part 1 of the workbook focuses on a strategic framework by presenting material that is publicly available. This material is intended to encourage your comment on what needs to be part of Ontario's framework.

1.1 What is Biodiversity?

Many similar definitions have been developed and used in countries around the world:

- Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems (Convention on Biological Diversity, UNEP, 1994).
- Biodiversity is the totality of genes, species, and ecosystems in a region (WRI, IUCN, UNEP, 1992).
- Biological diversity encompasses all species of plants, animals, microorganisms and the ecosystems and ecological processes of which they are part (McNeely et al., 1990).
- Biodiversity encompasses biological organization at levels ranging from complete ecosystems to the genetic structures that are the basis of heredity (State of the Forest Report, MNR, 2002).
- Biological diversity is the total variability of life on Earth (Heywood et al., 1995).

Question 1: Is there one of these definitions that you prefer?

Discussion "Starters" and Samples

- Biodiversity is the variety of species and ecosystems on earth and the ecological processes of which they are a part (Environment Canada, Canadian Biodiversity Strategy, 1995).
- Biodiversity is simply the 'Variety of Life' (Government of Saskatchewan, 2004).

Your views/thoughts/comments

Question 2: "Is there a better definition for biodiversity? Where is it/what is it?"

Many of the aforementioned definitions explicitly reference three components of biological diversity:

1.1.1 Genetic Diversity

Genetic diversity refers to variation within and variation between populations of species, and is measured in terms of, for example, variation between genes or between DNA or amino acid sequences, as well as numbers of breeds, strains, and distinct populations (Heywood et al., 1995).

Question 3: What definitions would you like to see in the Ontario Biodiversity Strategy regarding genetic, species and ecological diversity?

1.1.2 Species Diversity

Species diversity refers to the variety of living organisms on Earth (McNeely et al., 1990).

Species diversity refers to the variety of species within a region. Such diversity can be measured in many ways, and scientists have not settled on a single best method. The number of species in a region – its species 'richness' – is one often-used measure, but a more precise measurement, 'taxonomic diversity', also considers the relationship of species to each other (WRI, IUCN, and UNEP, 1992).

1.1.3 Ecological Diversity

Ecological diversity refers to the numbers of species in given areas, the ecological roles that these species play, the manner in which species composition changes across a region, and the groupings of species (ecosystems) that occur in particular areas (such as grassland or forest), together with the processes and interactions that take place within and between these systems. It also covers the diversity of ecosystems in landscapes, of landscapes in biomes, and of biomes on the planet (Heywood et al., 1995).

Question 4: Have we missed a definition that you would like to see considered?

1.2 The Value of Biological Diversity

What is the value of biodiversity?

"Biodiversity represents the very foundation of human existence" (Elizabeth Dowdeswell, UNEP, 1995)

The Convention on Biological Diversity (UNEP, 1994) includes the following reference to values in the preamble:

- Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components.
- Conscious of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere.
- Recognizing the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conserva-

Question 5: What values of biodiversity would you like to see included in the Strategy? Are there values that you think should not be included?

tion of biological diversity and the sustainable use of its components.

- Acknowledging that substantial investments are required to conserve biological diversity and that there is the expectation of a broad range of environmental, economic, and social benefits from those investments.
- Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing word population, for which access to and sharing of both genetic resources and technologies are essential.

The Secretariat of the Convention on Biological Diversity (UNEP, 2000) noted that conserving biodiversity ensures the availability of the following "goods and services":

- Provision of food, fuel and fibre
- Provision of shelter and building materials
- Purification of air and water
- Detoxification and decomposition of wastes
- Stabilization and moderation of the Earth's climate
- Moderation of floods, droughts, temperature extremes and the forces of wind
- Generation and renewal of soil fertility, including nutrient cycling
- Pollination of plants, including many crops
- Control of pests and diseases
- Maintenance of genetic resources as key inputs to crop varieties and livestock breeds, medicines and other products
- Cultural and aesthetic benefits
- Ability to adapt to change

1.3 Ontario – A Diverse Place

Ontario is a province of enormous geographic scale with diverse and contrasting landscapes that are found in three distinct ecological zones:

Hudson Plains Ecozone: This northernmost ecozone encompasses approximately 25% of the province. This ecozone is found north of the Precambrian Shield, and encompasses the limestone bedrock along the coasts and inland from Hudson Bay and James Bay. This ecozone contains Ontario's largest protected area, Polar Bear Provincial Park.

Question 6: Have we missed an important point in this brief description of Ontario's rich biodiversity? Is ther some part of the description that should not be included?

Wetland vegetation types are an important feature of this ecozone. For example, sedge fens are located near the coast and among the inland coniferous forests. On drier sites, herb-moss-lichen associations grow near the coast, and open upland coniferous forests (taiga) grow along river levees and old beach ridges. Characteristic wildlife species include woodland caribou, moose, black bear, and marten. The arctic fox, snow goose, and polar bear frequent coastal habitats. Characteristic fish species include the lake sturgeon, brook trout, lake herring, lake whitefish, northern pike, and walleye.

Ontario Shield Ecozone: This ecozone occupies more than half of Ontario. The Precambrian Shield underlies this ecozone, extending from the Hudson Bay Lowlands and the limestone in the north to the limestone bedrock in the south. Fire, insects, and wind are important forces of change in the conifer-dominated

boreal forests in the central and northern parts and the pine, oak and maple forests in the southern part of the ecozone.

Vegetation varies across the ecozone. Coniferous forests composed of spruces, balsam fir, jack pine, and tamarack dominate in the north. In the south, mixed forests and deciduous forests of tolerant hardwoods (e.g., sugar maple and American beech) are more frequent. Wetlands, including peatlands, are abundant. Northern and southern species and ecosystems are located in this ecozone. Woodland caribou, white-tailed deer, moose, black bear, gray wolf, eastern wolf, canada lynx, marten, beaver, red squirrel, barred owl, boreal owl, white-throated sparrow, pileated woodpecker, blue jay, and gray jay are among the characteristic wildlife. Important fish species include lake sturgeon, brook trout, lake trout, lake herring, lake whitefish, northern pike, smallmouth bass, yellow perch and walleye.

Mixedwood Plains Ecozone: Ontario's southernmost ecozone is located on the limestones and dolostones south of the Precambrian Shield. In Ontario, this ecozone is bounded along its southern and western edges by Lake Huron, Lake Erie, Lake Ontario, and the St. Lawrence River.

Vegetation is diverse, despite the conversion of most forested land and wetlands to human uses. Mixed deciduous-evergreen forests and tolerant hardwood forests (including those forests known as Carolinian forests) grow here. Alvars and tall-grass prairies also occur in this ecozone. Wetlands are frequent in certain areas, although many wetlands have been drained. The fauna and flora are among the most diverse in Canada. However, the number of species at risk is also high due to the significant habitat loss. Among the characteristic species in the ecozone are white-tailed deer, red fox, raccoon, striped skunk, beaver, gray squirrel, great blue heron, and blue jay. Characteristic fish species include longnose gar, bowfin, brook trout, lake trout, lake herring, lake whitefish, northern pike, muskellunge, american eel, smallmouth bass, largemouth bass, rock bass, bluegill, pumpkinseed, and walleye. Alien species, which displace native species and alter ecosystem structure and function, are an increasing problem in this ecozone.

In summary, Ontario's diverse biological diversity is, in large part, a function of its latitudinal length and longitudinal width (1,688 km by 1,553 km), encompassing more than 107 million hectares. From the sub-arctic ecosystems along the Hudson Bay coast to the Carolinian Life Zone (Eastern Deciduous Forest) in southwestern Ontario, live more than 3,386 species of vascular plants; some 130 liverworts, 140 ferns and fern allies and 540 mosses; more than 1,000 species of fungi and algae, and 730 lichens; 271 molluscs; 139 worms; hundreds of vertebrate species, including 478 bird species, 87 mammals, 30 reptiles, 29 amphibians, and 166 species of fish; and more than 6,560 insect species and 689 other invertebrates.

Ontario is an important economic centre, and is characterized by a densely populated south where agriculture, primary industry, manufacturing, and service industries dominate. In the north, ecotourism and other recreation-oriented industries, forestry, and mining provide an economic base for northerners. Approximately 13% of the land in Ontario is privately owned and the remaining 87% is managed by the Crown. Most of the private land is located in southern Ontario.

The current population of approximately 12 million is expected to increase by over four million by 2031. A large percentage of this growth is projected to occur in the Greater Golden Horseshoe. Strategies to conserve and sustainably use the province's biological resources must recognize this expected growth in population.

2.0 Threats to Biodiversity

Human population growth and a continued and increased demand for goods and services will impact genetic, species, and ecological diversity. Known and potential impacts are documented and described in many publications, such as The Status of Wildlife Habitats in Canada 2001 (WHC, 2001) and The Nature Audit (WWF, 2003). Five generic categories are usually used to describe the major threats to biodiversity:

2.1 Habitat Loss and Fragmentation

Habitat alteration is the most significant threat to biodiversity resulting from land use change (McNeely et al., 1990:38). Alteration usually forces more diverse natural ecosystems into less diverse ecosystems, such as the conversion of forested land on farms to urban land. Habitat loss and fragmentation are particularly serious in southern Ontario where urbanization and road density are greatest. In the north, roads and resource extraction can impact Ontario's biodiversity. Resource extraction operations and associated transportation infrastructure potentially can have direct impact through habitat removal, alienation, and/or degradation of local waterbodies (WWF, 2003).

Question 7: Have we missed a threat to biodiversity that you think is important? Is there anything that we should not include as threats?

In Ontario's far north, there are growing concerns about the negative impacts of climate change on arctic ecosystems and their associated wildlife (e.g. polar bears).

2.2 Invasive Species

Alien species are species of plants, animals, and micro-organisms that have been accidentally or deliberately introduced by human action outside their natural past or present distribution (Environment Canada, 2004). Invasive alien species are those harmful alien species whose introduction or spread threatens the environment, the economy, and/or society, including human health. Invasive alien species can originate from other continents, adjacent countries, or from other ecosystems within Canada (Environment Canada, 2004).

Free from natural predation and competition in the ecosystem of origin, these invasive alien species often aggressively reproduce, and infest and damage or destroy native trees (e.g., the emerald ash borer), agricultural crops, wetlands (e.g., the purple loosestrife), and lakes and rivers (e.g., the zebra mussel).

Invasive species are one of the most serious threats to Ontario's biodiversity (WWF, 2003). For example there are 170 invasive aquatic species (plants, invertebrates, and fish) in Ontario. And 32% of all vascular plants in the province are considered invasive.

Invasive species inflict significant ecological and economic damage. For example,

in addition to disrupting ecosystem composition and structure, the zebra mussel can shut down electrical utilities by clogging water intake pipes and affect recreation by fouling public beaches (Invasive Species Strategy, 2003).

2.3 Pollution

Pollution is emitted in many different forms that include atmospheric pollution (e.g., sulphur and nitrogen oxides), chemicals (e.g., nitrates and phosphates), pesticides, particulate matter, and heavy metals (McNeely et al., 1990).

There are thousands of pollutants circulating through Earth's ecosystems, and many of these materials have significant large-scale impacts, such as acid rain on boreal and deciduous forests and associated aquatic ecosystems. At the individual and population level, manufactured chemicals and pollutants can contribute to a variety of health issues in wildlife, including cancer, hormone disruption, birth defects, behavioural abnormalities, and chronic illness (WWF, 2003).

2.4 Over-harvesting

Over-harvesting is the taking of individuals at a higher rate than can be sustained by the natural reproductive capacity of the population being harvested (McNeely et al., 1990). In Ontario, for example, wild american ginseng has been over-harvested from its natural habitat. While sustainable harvest of game species results from hunter commitment to conservation and as a result of formal hunter education and regulations, poaching remains an issue.

2.5 Climate Change

People have added carbon dioxide, nitrous oxide, and other greenhouse gases to the atmosphere by extracting and burning fossil fuels such as coal, oil, and natural gas. The drainage of wetlands and the conversion of forests and grasslands to other uses have also contributed to the release of greenhouse gases to the atmosphere as carbon stored in these ecosystems is released by decomposition. Atmospheric carbon dioxide has increased 30% since pre-industrial times, and these additional greenhouse gas molecules have trapped new heat and accelerated the rate of global warming.

The biosphere and the climate of the Earth form a complex system of biological, chemical, and physical processes that interact across a range of spatial scales and time frames (Betts and Midgley, 2003). Climate change will increasingly impact biological diversity. For example:

- Insect and/or disease outbreak patterns may become more severe.
- Plant species will autonomously change their distribution resulting in new types of forest. It is possible that a significant part of the boreal forest will be displaced by tree species from the south or convert to grassland.
- Animal species distributions continue to change. For example, the White-tailed Deer, Virginia Opossum, and Southern Flying Squirrel now survive hundreds of kilometres north of their traditional range.

3.0 Strategic Framework

We use strategic thinking and planning to identify, establish, and modify short- and long-term direction -- to envision the future, to examine scenarios, and to identify potential paths of opportunity. Strategic thinking is visioning. Strategic planning is a tool with which agencies, organizations, and individuals not only anticipate and manage for change, but can also function as a significant force of that change.

3.1 Vision

A vision is the object of an effort – it is a high level statement of aim, of destination. Several examples of vision statements include:

- A society that lives and develops as part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in biodiversity (Environment Canada, 1995).
- Saskatchewan will act with wisdom and prudence today to ensure we leave future generations a nurturing and dynamic environment rich in its biodiversity (Government of Saskatchewan, 2004).
- Our vision is for a country – its landscapes and water bodies, coasts and seas, towns and cities – where wild species and habitats are part of healthy functioning ecosystems; where we nurture, treasure and enhance our biodiversity, and where biodiversity is a natural consideration of policies and decisions, and in society as a whole (DEFRA, 2003).
- Mindful of the importance of our natural heritage to the well being of present and future generations, recognizing that sustainable use of biodiversity is the only way to secure its availability to future generations, and being conscious of the intrinsic value of biological diversity, we accept our responsibility to conserve and protect Jamaica's biodiversity through sustainable use and fair and equitable sharing of the benefits derived from this biodiversity (NEPA, 2001).

Question 8: What do you think is important in a Vision for Ontario's Biodiversity? Do you prefer any of the Visions from other strategies that we have included? Is there another Vision that you would recommend?

3.2 Goals

Like the vision, a goal is an object of an effort, an aim, a destination. The goal is more specific than the vision, but continues to define the state or condition to which one aspires. For example the goals for the Canadian Biodiversity Strategy (Environment Canada, 1995), are:

1. To conserve biodiversity an use biological resources in a sustainable manner
2. To improve our understanding of ecosystems and increase our resource management capability
3. To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner
4. To maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources
5. To work with other countries to conserve biodiversity, use biological resources in a sustainable manner and share equitable the benefits that arise from the utilization of genetic resources

Question 9: What do you think is important in a Goal for Ontario's Biodiversity? Do you prefer any of the Goals from other strategies that we have included? Is there another Goal that you would recommend?

The WWF (2003) maintains that Canada needs to be equally active on three key conservation fronts to achieve its conservation goals:

"1. Protection.
2. Sustainable management of natural resources; and,
3. Restoration and recovery of its species and habitats."

The aim of the 1980 World Conservation Strategy is to:

"1. Maintain essential ecological processes and life support systems.
2. Preserve genetic diversity.
3. Ensure sustainable utilization of species and ecosystems (IUCN, UNEP, and WWF, 1980)."

3.3 Strategies and Actions

Strategies are statements of need and commitment. Action statements articulate how the commitment will be delivered. Examples of strategies and actions are provided in Part 2 of this workbook.

3.4 Principles

A principle can be:

- A fundamental truth or law used as the basis for reasoning or action
- A personal code of conduct.

Many principles that contribute to the protection, sustainable use, and rehabilitation of biological diversity have been published in the last 20 years. For example, the Global Biodiversity Strategy (WRI, IUCN, UNEP, 1992) lists 10 principles for conserving biodiversity:

1. Every life form is unique, and warrants respect from humanity.
2. Biodiversity conservation is an investment that yields substantial local, national, and global benefits.
3. The costs and benefits of biodiversity conservation should be shared more equitably among nations and among people within nations.
4. As part of the larger effort to achieve sustainable development, conserving biodiversity requires fundamental changes in patterns and practices of economic development world-wide.
5. Increased funding for biodiversity conservation will not, by itself, slow biodiversity loss. Policy and institutional reforms are needed to create the conditions under which increased funding can be effective.
6. Priorities for biodiversity conservation differ when viewed from local, national, and global perspectives; all are legitimate, and should be taken into account. All countries and communities also have a vested interest in conserving their biological diversity; the focus should not be exclusively on a few species-rich ecosystems or countries.
7. Biodiversity conservation can be sustained only if public awareness and concern are substantially heightened, and if policy-makers have access to reliable information upon which to base policy choices.

Question 10: What do you think are important Principles for Ontario's Biodiversity? Do you prefer any of the Principles from other strategies that we have included? Is there another Principle that you would recommend?

8. Action to conserve biodiversity must be planned and implemented at a scale determined by ecological and social criteria. The focus of activity must be where people live and work, as well as in protected wildland areas.
9. Cultural diversity is closely linked to biodiversity. Humanity's collective knowledge of biodiversity and its use and management rests in cultural diversity; conversely, conserving biodiversity often helps strengthen cultural integrity and values.
10. Increased public participation, respect for basic human rights, improved popular access to education and information, and greater institutional accountability are essential elements of biodiversity conservation.

The Canadian Biodiversity Strategy (Environment Canada, 1995) lists 11 guiding principles:

1. Biodiversity has ecological, economic, social, cultural, and intrinsic values.
2. All life forms, including humans, are ultimately connected to all other life forms.
3. All Canadians depend on biodiversity and have a responsibility to contribute to biodiversity conservation and to use biological resources in a sustainable manner.
4. All Canadians should be encouraged to understand and appreciate the value of biodiversity and to participate in decisions involving the use of our air, water, land, and other resources.
5. An ecological approach to resource management is central to conserving biodiversity and using our biological resources in a sustainable manner.
6. Development of decisions must reflect ecological, economic, social, and cultural values.
7. Healthy, evolving ecosystems and the maintenance of natural processes are prerequisites for the in-situ conservation of biodiversity and the sustainable use of biological resources.
8. Ex-situ measures may be required to support the conservation of some species and populations and are essential to ensuring the sustainable use of many agricultural, forests, and aquatic resources.
9. The knowledge, innovations and practices of indigenous and local communities should be respected, and their use and maintenance carried out with the support and involvement of these communities.
10. The conservation of biodiversity and the sustainable use of biological resources should be carried out using the best knowledge available and approaches refined as new knowledge is gained.
11. The conservation of biodiversity and the sustainable use of biological resources requires local regional, provincial, territorial, national and global cooperation and a sharing of knowledge, costs, and benefits.

Principles presented in the Australian Biodiversity Strategy (Department of Environment, Sport, and Territories, 1996) include:

1. Biological diversity is best conserved in-situ.
2. Although all levels of government have clear responsibility, the cooperation of conservation groups, resource users, indigenous peoples, and the community in general is critical to the conservation of biological diversity.
3. It is vital to anticipate, prevent and attack at source the causes of significant reduction or loss of biological diversity.

Discussion "Starters" and Samples	Your views/thoughts/comments
4. Processes for and decisions about the allocation and use of Australia's resources should be efficient, equitable and transparent.	
5. Lack of full knowledge should not be an excuse for postponing action to conserve biological diversity.	
6. The conservation of Australia's biological diversity is affected by international activities and requires actions extending beyond Australia's national jurisdiction.	
7. Australians operating beyond our national jurisdiction should respect the principles of conservation and ecologically sustainable use of biological diversity and act in accordance with any relevant national or international laws.	
8. Central to the conservation of Australia's biological diversity is the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource production systems.	
9. The close, traditional association of Australia's indigenous peoples with components of biological diversity should be recognized, as should the desirability of sharing equitably benefits arising from the innovative use of traditional knowledge of biological diversity.	

Part 2 - Introducing the Strategic Directions and Action Plans...

The purpose of Part 2 of this workbook: is to present a number of examples of "strategic directions" and "actions" that were included in the Canadian Biodiversity Strategy and/or other publicly available strategic documents. This presentation is intended to assist you (but not limit you!) in preparing comments/advice to assist the preparation of the proposed Ontario Biodiversity Strategy.

The topics covered in Part 2 stem from the topics that were discussed in the Canadian Biodiversity Strategy (e.g. protected areas; species and ecosystem recovery) and the standard template that I have asked, as facilitator, be applied to each topic (i.e. 1. Scope; 2. Challenge, Issues, Opportunities; 3. Goals, Objectives, Strategies; 4. Strategic Actions).

The quotations that are included in Part 2, albeit a very lengthy presentation, are not intended to be an exhaustive list. Rather they are intended to stimulate your thinking about topics and actions (and especially actions within the next five years) so as to identify a much more focused and action oriented list that Ontarians should implement to conserve the province's biodiversity and sustainably use its biological resources. We are particularly interested in your suggestions, including recommended priorities for the next five years, and how Ontarians might work together to deliver the actions that you recommend.

What topics do you think the proposed Ontario strategy should address? What are the key challenges, issues, opportunities? What goals, objectives, strategies should we identify? What should the priority actions be over the next five years? Is there anything else?

To provide structure to the presentation of the list of quotations, we grouped the topics under four broad subject headings: Conservation; Sustainable Use of Biological Resources; Supporting Strategies; and Implementation. We look forward to your ideas.

Part 2 - Strategic Directions and Actions: "How do we get to where we want to go?"

4.0 Conservation

4.1 Protected Areas

4.1.1. Scope

The Convention defines a protected area as "a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives. " Within that definition, protected areas may be established and managed to achieve one or more diverse objectives. These may include: the maintenance of ecological integrity; the conservation of ecosystem, species and genetic diversity; maintenance of essential ecological processes and life-support systems; wilderness preservation; scientific research and the protection of specific natural and cultural features; environmental education; outdoor recreation and tourism; and, in specific cases where consistent with the conservation objectives of the area, the sustainable use of resources from natural ecosystems.

Just as the purposes of protected areas vary, so too do the levels of protection afforded them. In some, human activities and access are strictly limited, while in others, multiple land-use objectives are pursued. Some protected areas fulfill more than one purpose and are zoned for different levels of protection. Site-specific analysis and establishment of management objectives is required to determine appropriate and compatible uses.

[Source: Canadian Biodiversity Strategy, 1995, pp. 23]

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

[Source: IUCN World Commission on Protected Areas, 1994]

Many types of protected areas have been established by jurisdictions throughout the world during the last century. Currently, more than 1380 different terms describe protected areas (1). In Ontario, the protection and conservation of natural areas formally dates to 1887 with the creation of the Queen Victoria Niagara Falls Park. Since then, more than 40 types of designations and numerous types of management zones within these designations have been created to care for many ecosystems throughout the province. More than 40 kinds of agencies and organizations are directly involved in protecting and/or managing these protected areas.

Protected areas in Ontario are located on federal and provincial public lands, which account for about 87 percent of the provincial landbase, as well as on municipal and private lands, which account for about 13 percent of the province. Just as the purposes of protected areas vary, so do the levels of protection afforded to them. Some have legislated protection and are formally described in regulation,

Question 11: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

some are protected through policy and management guidelines, while others are privately-owned. Some are managed according to narrow and strict objectives (e.g., Nature Reserve Provincial Parks), some permit a wider array of activities (e.g., Conservation Areas), and others have multiple national or international designations intended to acknowledge the outstanding qualities of an area (e.g., Canadian Heritage Rivers and Ramsar Convention wetlands).

[Source: Daniel R. Paleczny, Paul A. Gray, Tom J. Beechey, Robert J. Davidson and Jarmo V. Jalava., 2000. Ontario's Protected Areas: An Examination of Protection Standards with a Provisional Application of IUCN's Protected Area Management Categories. Proceedings of the Fourth International Conference on the Science and Management of Protected Areas, SAMPA and PRFO]

"What is Ecological Integrity?

According to the Canada National Parks Act, the law governing national parks in Canada, "ecological integrity" means, with respect to a park, "...a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes."

In plain language, ecosystems have integrity when they have their native components intact, including: abiotic components (the physical elements, e.g. water, rocks), biodiversity (the composition and abundance of species and communities in an ecosystem, e.g. tundra, rainforest and grasslands represent landscape diversity; black bears, brook trout and black spruce represent species diversity) and ecosystem processes (the engines that makes ecosystem work; e.g. fire, flooding, predation).

Source: Parks Canada Web Site: www.pc.gc.ca/progs/np-pn/eco_integ/index_E.asp

4.1.2 Challenges, Issues and Opportunities

Question 12: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

Despite the efforts of governments and non-government organizations, networks of ecological reserves, national, provincial, territorial and regional parks, managed wildlife areas, protected landscapes and internationally designated sites are not yet complete. Not all of our ecological regions are represented in existing protected areas networks. In some regions of the country, opportunities to establish protected areas are being diminished or foreclosed.

[Source: Canadian Biodiversity Strategy, 1995, p. 24]

The establishment and management of protected areas is not free of cost. Not only are there costs in acquiring and managing land, there may also be opportunity costs where multiple use is restricted and resources are no longer available for development.

[Source: National Strategy for the Conservation of Australia's Biological Diversity, Department of the Environment, Sport and Territories, 1996, page 5 of 11]

4.1.3. Goals, Objectives, Strategies

Question 13: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

The establishment and management of protected areas is the second element of the ecological management approach. Protected areas contribute to the conservation of biodiversity, although they must be complemented by sound stewardship across the entire country with particular attention to areas around protected areas.

[Source: Canadian Biodiversity Strategy, 1995, p. 22]

Objective 2

Protected Areas

Complete a system of protected areas that are representative of the province's terrestrial and aquatic ecosystems and ensure that they are managed to conserve biodiversity in a manner consistent with their designated level of protection

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, Government of Saskatchewan, p.11]

To establish a system of protected natural heritage areas, representing the full spectrum of the province's natural features and ecosystems."

Identification: To identify, evaluate and select areas that embody the provincially significant geological, aquatic and terrestrial diversity of the Province.

Protection: To protect a system of natural heritage areas through legislation, regulations, policies and programs.

Supportive Land Management: To foster land use planning and management in the intervening landscape that ensures ecological sustainability of a system of protected natural heritage areas.

Area Management: To manage a system of protected natural heritage areas in order to retain and restore representative and special ecological and geological features, processes and systems.

Shared Responsibility: To establish and manage a system of protected areas on public and private lands through consultation, cooperation, and partnerships among government and non-government organizations, Aboriginal peoples, industry and private landowners.

[Source: Natures Best: Ontario's Parks & Protected Areas A Framework and Action Plan (February 1997)]

4.1.4. Strategic Actions

Strategic Directions

1.13 Make every effort to complete Canada's networks of protected areas representative of land-based natural regions, by the year 2000 and accelerate the protection of areas that are representative of marine natural regions.

1.14 Use open and meaningful public and stakeholder participation processes and sound scientific information and traditional knowledge to ensure that social, economic, cultural and ecological factors are considered in the establishment of protected areas.

1.15 Use interim protection measures to ensure that candidate protected areas are not compromised by development.

1.16 Develop comprehensive criteria for determining priority sites for designation as protected areas considering criteria such as: the habitat requirements for species-at-risk and endemic species and other critical wildlife habitat; areas supporting high diversity; migratory species or representative or unique species; and genetic resources that are of scientific or economic importance.

1.17 Prepare and implement, in consultation with interested stakeholders, legislation and policies, inventories, plans, guidelines, monitoring programs and other measures to support the establishment and management of protected areas.

1.18 Manage, in consultation with landowners, regional and urban governments, local and indigenous communities, and interested stakeholders, human activities in and around protected areas to minimize adverse impacts on protected area biodiversity and to maintain connectivity, using mechanisms such as United Nations Educational, Scientific and Cultural Organization Biosphere Reserve Program.

Question 14: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

Discussion "Starters" and Samples

Your views/thoughts/comments

1.19 Support and promote the development of agreements between governments and local and indigenous communities, property-owners and/or private corporations for the voluntary allocation of land for conservation purposes.

1.20 Use a variety of mechanisms, including easements and covenants, to secure relatively intact ecosystems within intensively developed areas, and restore or rehabilitate them if necessary and practical.

[Source: Canadian Biodiversity Strategy, 1995, pp. 24-25]

2.1 continue implementation of the Representative Areas network (RAN) to ensure adequate representation of the province's natural ecosystems.

- Protect 12% of Saskatchewan's lands and waters, and as we move from the current 8.7% to 12%, allow flexibility to consider and accommodate new information on land values that may result in changes to the boundaries of selected areas, except in areas of unique ecological value: Ongoing
- Finalize the boundaries and designation of RAN sites within the northern ecoregions of the province: 2006
- Identify candidate sites within the Prarie Ecozone: 2008
- Assess the RAN to determine which sites can be used as ecological benchmarks: 2006
- Develop management policies and standards that apply to all sites recognized by the RAN program: 2005

2.2 Develop and implement policies, guidelines and management plans for all protected areas

- Establish human activity policies for all ecological reserves: 2005
- Develop management plans for all Ecological Reserves in the Boreal Plain and Boreal Shield Ecozones: 2005
- Identify Provincial Parks and Fish and Wildlife Development Fund (FWDF) lands having biodiversity most at risk and prepare and implement five management plans per year: Ongoing
- Implement conservation action for Park Land that supports ecological (and cultural) integrity, including the reintroduction of natural disturbance regimes, aand demonstrates ecosystem-based management to the public: Ongoing

[Source: "Caring for Natural Enviornments..." Op. cit, p.11]

4.2 Species and Ecosystem Recovery

4.2.1. Scope

C. Restoration and Rehabilitation

The third element of the ecological approach is restoration and rehabilitation, which includes the restoration or rehabilitation of species and ecosystems.

Rehabilitation and Restoration

Article 8:

f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species through the development and implementation of plans or other management strategies.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, pp. 25-26]

Question 15: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

4.2.2 Challenges, Issues and Opportunities

Ecosystem restoration and rehabilitation can be extremely expensive and is not always successful in fully restoring ecosystems. Preventing ecosystem degradation is, therefore, critical. The cost and scientific and technical implications of each proposed restoration or rehabilitation program must be critically evaluated to determine the program's long-term value in conserving biodiversity. In some cases, scarce financial and human resources could be used more effectively in other conservation initiatives.

[Source: *Canadian Biodiversity Strategy*, 1995, p. 28]

Question 16: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

4.2.3. Goals, Objectives, Strategies

Objective 4

Species and Ecosystems at Risk:

Protect species at risk (SAR) and prevent new species and ecosystems from becoming threatened through an ecosystem-based approach that is both responsive to the needs of provincially listed species, and that is integrated with the federal Species At Risk Act.

[Source: "Caring for Natural Environments: ..." Op cit., p.12]

Question 17: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

We agree to:

I. participate in the Canadian Endangered Species Conservation Council in order to coordinate our activities and resolve issues for the protection of species at risk in Canada;

II. recognize the Committee on the Status of Endangered Wildlife in Canada as a source of independent advice on the status of species at risk nationally; and,

III. establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada, and that will:

a. address all non-domestic species;

b. provide an independent process for assessing the status of species at risk;

c. legally designate species as threatened or endangered;

d. provide immediate legal protection for threatened or endangered species;

e. provide protection for the habitat of threatened or endangered species;

f. provide for the development of recovery plans within one year for endangered species and two years for threatened species that address the identified threats to the species and its habitat;

g. ensure multi-jurisdictional cooperation for the protection of species that cross borders through the development and implementation of recovery plans;

h. consider the needs of species at risk as part of environmental assessment processes;

i. implement recovery plans in a timely fashion;

j. monitor, assess and report regularly on the status of all wild species;

k. emphasize preventive measures to keep species from becoming at risk;

l. improve awareness of the needs of species at risk;

m. encourage citizens to participate in conservation and protection actions; and,

n. provide for effective enforcement.

[Source: National Accord for the Protection of Species at Risk, EC Web Site: www.ec.gc.ca/press/wild_b_e.htm]

Discussion "Starters" and Samples

Your views/thoughts/comments

4.2.4. Strategic Actions

"Strategic Directions

1.21 Federal, provincial and territorial governments will review their current legislation to determine if improvements are required in order to protect species-at-risk and their habitats, determine the benefits and costs of a more harmonized legislative approach and pursue harmonization where appropriate and practical.

1.22 Federal, provincial and territorial governments will work towards harmonizing methodologies to designate species-at-risk.

1.23 Determine the ecological requirements of species-at-risk and develop, implement and evaluate the success of recovery plans for species that are defined as extirpated, endangered or threatened, where practical and necessary. Consider the recovery of vulnerable species on a case-by-case basis.

1.24 Consider multi-species/habitat recovery plans for areas that contain a number of species-at-risk.

1.25 Encourage the involvement of ex situ facilities and expertise in the recovery of species-at-risk.

1.26 Federal, provincial and territorial governments will continue to participate and support the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Recovery of Nationally Endangered Wildlife (RENEW) and new programs such as the Canadian Nature Federation's Endangered Plants and Invertebrates of Canada program (EPIC). Expand the mandate of COSEWIC and RENEW to encompass further taxonomic groups adding groups incrementally. Canadian Biodiversity Strategy

1.27 Expand the mandate of COSEWIC and RENEW to encompass further taxonomic groups adding groups incrementally. Canadian Biodiversity Strategy

1.28 Enhance participation of urban and regional governments, local and indigenous communities and landowners in species recovery projects from early planning phases through implementation.

1.29 Support and promote international efforts to recover species-at-risk by: participating in mechanisms, such as the Convention on International Trade in Endangered Species, that regulate or control trade in species-at-risk; supporting the recovery of migratory and trans-boundary species-at-risk; and participating in other international efforts, such as the IUCN Species Survival Commission.

1.30 Using objective criteria to select sites for restoration and rehabilitation, including the habitat requirements of species-at-risk, develop and implement restoration or rehabilitation plans for degraded ecosystems, where practical and necessary.

1.31 Develop improved approaches and technologies for ecosystem restoration and rehabilitation, evaluating the potential impacts of programs on ecosystems and species to ensure that desired outcomes are achievable without causing negative impacts.

[Source: Canadian Biodiversity Strategy, 1995, pp. 26-27]

Question 18: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

4.1 Ensure adequate protection for species at risk (SAR) under The Wildlife Act and protect ecosystems inhabited by SAR.

Prioritize species suspected of being at risk: 2005

Review high priority species and list those deemed to be at risk under The Wildlife Act: 2007

Review protective status of ecosystems on which SAR depend: 2006

4.2 Ensure that recovery plans are developed to consider the ecosystems on which the species depends. Act to protect habitat of species and ecosystems at risk.

Complete recovery plans for high priority SAR within an ecosystem context: Ongoing

In cooperation with land owners and managers, implement relevant protection: Ongoing

4.3 Enhance scientific knowledge about the distribution and abundance of species at risk, and their ecological relationships.

Develop and test spatial models that predict the occurrence of SAR and/or threatened plant communities: Ongoing

Conduct surveys on lands suspected to contain SAR and/or threatened plant communities and areas with little data: Ongoing

4.4 Enhance the accessibility of information about species at risk.

Develop materials that assist with the rapid field identification of SAR, particularly plants: 2005

Develop materials that describe a standard approach to SAR surveys, especially plants: 2006

Enhance web-based access to SAR information: Ongoing

[Source: "Caring for Natural Environments: ..." Op. cit, p.12]

4.3 Invasive Species

4.3.1. Scope

Question 19: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Harmful Alien Organisms

Alien organisms are species that enter ecosystems beyond their natural range through deliberate or inadvertent introduction by humans. Organisms that have extended their natural range without human help are not considered alien. The term "alien" is not meant to imply positive or negative impacts on biodiversity. Many alien organisms have been intentionally introduced into Canada and have provided important economic and social benefits. For example, most of Canada's agricultural crops and many horticultural products were developed from genetic material obtained in other countries.

[Source: Canadian Biodiversity Strategy, 1995, p. 41]

The introduction and spread of Invasive Alien Species is affecting Canada's environment, economy, and society, including human health. The current threats posed by existing and potential invasive alien species are significant and are growing at an alarming rate. The need for Canada to take measures to address invasive alien species and protect and conserve Canada's natural resources and associated industries as well as the health of wildlife and humans, is essential.

Alien species are species of plants, animals, and micro-organisms introduced by human action outside their natural past or present distribution. Invasive alien species are those harmful alien species whose introduction or spread threatens the environment, the economy, or society, including human health. Invasive alien species can originate from other continents, neighbouring countries, or from other ecosystems within Canada.

[Source: AN INVASIVE ALIEN SPECIES STRATEGY FOR CANADA (IAS), September, 2004, Government of Canada, p.1]

Discussion "Starters" and Samples

Your views/thoughts/comments

4.3.2 Challenges, Issues and Opportunities

Other alien organisms that have been introduced have caused harmful effects to biodiversity. Some well known examples are the sea lamprey and zebra mussels which have had considerable impacts on the Great Lakes ecosystem, and purple loosestrife, which has spread rapidly throughout wetland areas. Such undesirable introductions have had major environmental and economic impacts.

Impacts of Harmful Alien Organisms

Human use and enjoyment of natural areas is directly affected by harmful alien organisms. For instance, Eurasian watermilfoil has invaded many lake shorelines and slow-moving rivers in Ontario and southern British Columbia adversely affecting these areas as recreational resources.

Harmful alien organisms may affect biodiversity through species displacement, disease, parasitism, hybridization, predation or habitat destruction. This results in the decline or extinction of native or endemic populations and the transformation or degradation of ecosystems. Control or elimination of harmful alien organisms is necessary to conserve biodiversity and prevent the further destruction of ecosystems.

[Source: Canadian Biodiversity Strategy, 1995, p. 41]

Question 20: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

The ways in which invasive alien species are introduced or spread, are called pathways. Introductions can be both intentional (purposeful) or unintentional (accidental) and they can be "authorized" or "unauthorized" (illegal). There are many pathways of introduction (vectors) including ballast water, recreational boating, aquarium trade, pet trade, horticultural trade, "hitchhikers" on commodities, stowaways in various modes of transportation, and disease in wildlife. Canada's strategic approach to address invasive alien species, as discussed in more detail later in this [quoted] document, will focus on pathways of introduction.

According to the World Conservation Union, invasive alien species are the second most significant threat to biodiversity, after habitat loss. In their new ecosystems, invasive alien species become predators, competitors, parasites, hybridizers, and diseases of our native and domesticated plants and animals. The impact of invasive alien species on native ecosystems, habitats and species is severe and often irreversible.

A preliminary report of the economic costs resulting from invasive alien species conservatively estimated annual cumulative costs for 16 species is between $13.3 and $34.5 billion. These estimates are known to be incomplete, and it is widely estimated that the damage resulting from past introductions of harmful invasive plant pests on agricultural crops and forestry is $7.5 billion annually.

Invasive alien species can result in significant social costs, especially to rural Canadian and Aboriginal communities that remain dependent upon agricultural and natural resources. Introductions can also have significant wildlife and human health dimensions as recently demonstrated with the introduction and spread of West Nile Virus.

[Source: IAS, Op. cit. pp.1-2]

4.3.3. Goals, Objectives, Strategies

Alien Organisms

Article 8:

Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 41]

Question 21: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

This Strategy proposes to respond to the invasive alien species challenge through a hierarchical approach that prioritizes:

1) prevention of new invasions;
2) early detection of new invaders;
3) rapid response to new invaders; and
4) management of established and spreading invaders (containment, eradication, and control).

[Source: IAS, Op. cit. p. 3]

4.3.4. Strategic Actions

Strategic Directions

1.81 Take all necessary steps to prevent the introduction of harmful alien organisms and eliminate or reduce their adverse effects to acceptable levels by:

a) developing and implementing effective means to identify and monitor alien organisms;
b) determining priorities for allocating resources for the control of harmful alien organisms based on their impact on native biodiversity and economic resources, and implementing effective control or, where possible, eradication measures;
c) identifying and eliminating common sources of unintentional introductions;
d) developing national and international databases that support the identification and anticipation of the introduction of potentially harmful alien organisms in order to develop control and prevention measures;
e) ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful alien organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures; and
f) enhancing public education and awareness of the impacts of harmful alien organisms and the steps that can be taken to prevent their introduction.

1.82 Promote research into methods and approaches that improve our ability to assess whether or not alien organisms will have an adverse impact on biodiversity.

[Source: Canadian Biodiversity Strategy, 1995, pp. 41-42]

Question 22: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

5.1 Establish a province-wide committee to develop a provincial invasive exotic species strategy: 2005

5.2 Develop a strategy to address the threat of invasive exotic species and carry out research and monitoring to evaluate their distribution and dispersal within the province: 2006

5.3 Identify and introduce measures to prevent the introduction of invasive exotic species, including pathogens and parasites through known pathways of introduction and natural dispersal into the province.

Development of import protocol and implementation for all wildlife imports: 2006

Development of a risk assessment plan with predictive capacity for new species introduction including for agricultural and horticultural applications: 2005

5.4 Identify and introduce measures to control populations of invasive exotic

species existing in province.

Identification of priority species with cost-effective and practical eradication or reduction programs outlined: 2006

5.5 Participate in national programs and work with neighbouring jurisdictions to manage invasive exotic species within the province.

Participate in the National Invasive Exotic Species Working Group to develop and implement a strategy to address issues of national concern: Ongoing

[Source: "Caring for Natural Environments:..." Op. cit., p.13]

"Prevention

For intentional introductions, prevention focuses on the application of risk analysis and prior approval of all proposed introductions. An integrated approach will be used that integrates environmental, socio-economic and human health considerations, and is consistent nationally and internationally across sectors. Measures to reduce unintentional introductions will likewise involve the use of risk analysis as well as technical measures to minimize the risk of introductions through pathways such as commodities and transportation vectors. Management plans will be needed for risk commodities and vectors. Other measures may include increasing risk assessment capacity, conducting scientific research to better predict the invasiveness of alien species, and developing public education programs with stakeholders. A surveillance strategy that includes pre-border and border inspection and interception is essential to verify authorized introductions, detect illegal introductions, and detect unintentional introductions through key commodities, pathways, and vectors, as is the capacity to implement the strategy.

Early Detection

A co-ordinated program of site-specific and general monitoring around critical points of entry, protected areas, and urban and agricultural ecosystems is essential for early detection. A core capacity of diagnostics, taxonomic expertise and innovative taxonomic research are critical to accurately identify invasive species once they are detected and distinguish them from native or long established species.

Rapid Response

When invasive alien species circumvent prevention measures and enter Canada, it is essential to respond rapidly before – or immediately after - they become established and spread. Integrated rapid response networks are required, and contingency plans and emergency funds for quarantine and eradication measures are essential to eradicate, contain, or control invasives immediately upon entry. This necessitates the development of an integrated economic, environmental, and human health risk analysis to determine appropriate options for rapid response. It is critical that emergency response be exempt from lengthy approval processes.

Management – Containment, Control, Eradication

Invasive species impacting aquatic, animal, and plant health should be prioritized for targeted management activities, research, and innovation to minimize their long-term costs. Risk analysis, benefitcost analysis, and other tools can be used to identify and prioritise the most appropriate and cost-effective mitigation measures to be undertaken. Eradication, containment, and control measures of agreed-upon priority invasive species can involve physical, chemical, biological or

integrated strategies. Scientific research on eradication, containment, and control methods and technologies for priority invasive alien species is also important.

[Source: IAS, Op. cit. pp 3-4]

5.0 Sustainable Use of Biological Resources

5.1 Sustainable Use of Aquatic Ecosystems

5.1.1. Scope

Aquatic Areas

Aquatic areas include freshwater, marine and wetland ecosystems. For centuries humans have used these ecosystems for food, recreation, sewage treatment, transportation, irrigation, cultural and spiritual purposes. Ground and surface waters are used as sources of potable water, and access to water has been a determining factor in the location of towns, cities, farms and other settlements. Globally, aquatic ecosystems produce the largest single source of animal protein for human consumption. Aquatic resources are also used for medicines and as raw material for manufacturing industries. Marine ecosystems play a significant ecological role, exerting influence over global processes such as the absorption of atmospheric carbon dioxide.

[Source: Canadian Biodiversity Strategy, 1995, p. 34]

Question 23: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

5.1.2 Challenges, Issues and Opportunities

While humans have benefited enormously from aquatic ecosystems, they have not always used these resources in a sustainable manner. Some aquatic ecosystems have been stressed by commercial exploitation, long-range transport of contaminants, loss of habitat, and local and regional developments.

The Great Lakes and St. Lawrence ecosystems have been greatly modified by intensive fishing, introduced species, pollutants and habitat changes. On the Atlantic coast, major reductions of groundfish species such as the northern cod appear to be due to a number of factors, including high exploitation, predation, inappropriate harvesting practices and environmental variants that have affected the survival of very young fish as well as growth rates and behaviour. On the Pacific coast, salmon, halibut and herring have gone through major fluctuations due to fishing pressure and environmental changes.

Significant reductions in population size and distribution can erode genetic diversity and ultimately lead to the extinction of species. In communities that depend upon biological resources, significant reduction in aquatic resource harvesting levels can devastate local economies and social well-being.

Approximately 1,100 species of fish are known to inhabit Canadian waters. (Ocean Voice International) Four freshwater species are thought to be extinct, two have been extirpated from Canadian waters and 53 are listed as endangered, threatened or vulnerable. (COSEWIC, 1994)

[Source: Canadian Biodiversity Strategy, 1995, p. 34]

Question 24: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

5.1.3. Goals, Objectives, Strategies

Goal for Ontario Fisheries

Healthy aquatic ecosystems that provide sustainable benefits, contributing to society's present and future requirements for a high-quality environment,

Question 25: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

wholesome food, employment and income, recreational activity and cultural heritage.

Objectives

In order to provide sustainable benefits for the future, the objectives of the Strategic Plan are:

- to protect healthy aquatic ecosystems;
- to rehabilitate degraded aquatic ecosystems; and,
- to improve cultural, social and economic benefits from Ontario's fisheries resource.

Source: Strategic Plan for Ontario Fisheries (SPOF II), Ontario Ministry of Natural Resources, 1989, MNR Web Site - www.gov.on.ca/fishing/spof.html

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Vision: An increase in the quantity and quality of Canada's wetlands where the ecological and hydrological functions are maintained or enhanced for the sustainable use of Canadians and Nature.

Strategies:

1. Changing the Policy Framework. By 2013, establish a policy framework in Canada that supports Canada's Wetland Vision.
2. Integrated Watershed Management. By 2013, have in place an integrated landscape and watershed management approach to wetland conservation and protection across Canada, supported by appropriate incentives, policies, partnerships and programs, based on accessible science, data and information.
3. National Wetland Inventory. By 2013, have in place a national, repeatable inventory of Canada's wetlands, one that covers the extent, rarity, class, form and type, health status, function and social, economic and ecological values and aspects of wetlands.
4. Governance and Mechanisms: By 2013, have in place a governance structure and supporting mechanisms that facilitate wetland conservation and protection.
5. Enhancing Capacity: By 2013, have in place across Canada the resources, science, knowledge, tools and degree of understanding to provide the means to fulfill Canada's Wetland Vision.
6. Promoting Wetland Education and Communication: By 2013, achieve a high level of ecological literacy by Canadians, including a greater understanding of wetland functions and values.
7. Fostering a Sustainable Wetland Industry: By 2013, Canada has a thriving, sustainable and internationally-recognized wetland industry.

[Source: Wetlands Stewardship - New Directions, Final Report of the Conference on Canadian Wetlands Stewardship Report No. 03-3]

5.1.4. Strategic Actions

Strategic Directions

1.51 Assess current and proposed major government aquatic resource policies and programs to ensure that ecological, economic, social and cultural objectives are considered. Use objective criteria to select sites for restoration and rehabilitation, and restore or rehabilitate degraded aquatic ecosystems where

Quesiton 26: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

practical. In Canada there are at least 36 federal acts, 20 provincial and territorial acts, and numerous international conventions and accords relating to the protection and use of aquatic environments and resources.

1.53 Implement biological and ecological inventory, monitoring programs and classification systems to determine appropriate biodiversity conservation measures and provide a framework for managing aquatic resources on a sustainable basis.

1.54 Increase our understanding of the structure, function and composition of aquatic ecosystems to enhance conservation and management practices.

1.55 Enhance efforts to conserve aquatic biodiversity by protecting: species and ecosystems at risk, endemic species, vulnerable spawning areas and unique and representative ecosystems.

1.56 Establish reserves to conserve aquatic biodiversity and contribute to networks of national and international protected areas in accordance with the strategic directions provided in the section on protected areas of this Strategy.

1.57 Develop training programs to promote the use of equipment and harvesting procedures that eliminate, or reduce to acceptable levels, the adverse impacts on populations, species, habitats and ecosystems, including the capture of undersized fish, incidental catch, and habitat destruction.

1.58 Reduce to acceptable levels, or eliminate, adverse impacts of species introductions on aquatic biodiversity resulting from aquaculture projects, fisheries enhancement programs and interbasin transfers of water and organisms.

1.59 Investigate the use of alternative aquatic resource management mechanisms to enhance the integration of social, cultural, economic and ecological objectives.

1.60 Participate in international fisheries conservation efforts to develop and encourage the implementation of ecological management approaches, and to develop sustainable use agreements.

1.61 Conserve ocean-based fisheries resources by:

a) taking effective action to address foreign overfishing outside Canada's 200 mile limit;

b) improving the enforcement of existing rules within the Northwest Atlantic Fisheries Organization (NAFO); and

c) enhancing international collaboration in the development of conservation/sustainable use policies by building on discussions at the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks.

1.62 Support the development of international agreements to encourage the development of biological reference points in fisheries management that provide a basis for the conservation and sustainable use of harvested species.

1.63 Enhance communication with those who possess traditional knowledge to improve information sharing, and to promote the conservation of aquatic biodiversity and the sustainable use of aquatic biological resources.

1.64 Maintain or develop in situ and ex situ mechanisms to support the conservation of biodiversity and the sustainable use of aquatic biological resources by:

a) determining and acting upon federal, provincial, territorial, regional and international priorities for the conservation of aquatic biological resources, research and training, and the establishment of new facilities; and

b) determining federal, provincial, territorial, regional and international priorities for ex situ aquatic biological resources, facilities, research and

training.

[Source: Canadian Biodiversity Strategy, 1995, pp. 35-37]

The following strategic management actions address the issues that currently face fisheries managers.

1. Ensure benefits are sustained by protecting and rehabilitating aquatic ecosystems.
    - Ensure protection of healthy aquatic ecosystems and prevent further deterioration of degraded ecosystems.
    - Expand and improve efforts to rehabilitate degraded fish communities and habitat.
    - Allocate aquatic resources to provide a fair distribution of benefits to all stakeholders while ensuring sustainable benefits for future generations.
    - Provide for a variety of consumptive and non-consumptive opportunities based on naturally reproducing fish communities and judicious use of hatchery-reared fish stocks.
2. Inform and involve the public in decision making and program delivery to foster stewardship
    - Increase the public's understanding of resource management principles, the value of healthy ecosystems, and the results of fisheries management efforts.
    - Encourage communication among the public and stakeholders to foster harmony in resource use.
    - Develop and encourage public education and involvement programs based on the ecosystem approach to managing fisheries on a sustainable basis.
    - Improve consultation and involvement mechanisms for co-operative decision making and program delivery.
    - Work co-operatively through partnerships.
3. Ensure resources are appropriately valued.
    - Instill a broad appreciation of the value of the resources in those who benefit from them, and price access to aquatic resources, including fish, to reflect the cost of effective management.
4. Ensure effective program management and coordination among agencies.
    - Improve effectiveness of fisheries management systems.
    - Expand coordination among agencies sharing responsibility for managing aquatic ecosystems.
    - Ensure staff receive appropriate training in the skills required to be effective aquatic ecosystem managers.
    - Expand cooperative programs to increase efficiency and to ensure a comprehensive approach to ecosystem management. v
5. Acquire and communicate essential knowledge for timely and effective resource management decision-making.
    - Set priorities for acquisition of new knowledge based on resource management needs.
    - Develop improved techniques for the acquisition and application of knowledge to protect and rehabilitate fish communities and habitat.
    - Develop better understanding of fish communities and habitat and of the socio-economics of the fisheries resources. Increase understanding of the effects of environmental and social changes, as well as the impact of management actions.

- Improve communication of knowledge to managers, other agencies and the public to ensure understanding of the implications of management actions.

6. Enforce firmly and effectively.
   - Ensure enforcement priorities reflect protection and rehabilitation needs.
   - Focus efforts on regulating the harvest of naturally reproducing fish stocks.
   - Increase efforts to ensure compliance with legislation.
   - Evaluate effectiveness of enforcement efforts.

[Source: SPOF II, Op. cit.]

5.2 Sustainable Forest Management

5.2.1. Scope

Forests cover half of Canada and are essential to the survival of many species. As well as being ecologically significant on a global scale, forests are important contributors to our economic and social well-being. About 300 communities depend largely on forestry and more than 800,000 people work in the forest products industry or for organizations associated with it. In 1993, forest product exports contributed $22.4 billion to our net balance of trade.

Forest resources provide food, fuel and medicines for many communities, and are used for hunting, trapping, gathering, spiritual or religious purposes, and wilderness experiences. Being able to access and enjoy forested areas greatly improves our quality of life. While it is difficult to assign a monetary value to the social and cultural benefits of forests, these extremely important values must be considered in determining appropriate forest uses.

[Source: Canadian Biodiversity Strategy, 1995, pp. 37-38]

Question 27: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

5.2.2 Challenges, Issues and Opportunities

... some key biodiversity issues facing the forest sector in Canada.

These include:

- fragmentation and habitat loss;
- forestry practices (including forest inventory, forest planning, timber harvesting, tree planting, pest management and exotic pest species, and fire management);
- living modified organisms;
- wildlife species at risk;
- protected areas;
- conservation and exchange of forest genetic resources;
- atmospheric pollutants and climate change; and
- importance of biodiversity and acceptable methods of measuring biodiversity.

[Source: "Biodiversity in the Forest", The Canadian Forest Service Three Year Action Plan, Implementing the Canadian Biodiversity Strategy, Natural Resources Canada, 1997, p. 14]

Question 28: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

"...Canada faces three broad challenges:

- How can forest biodiversity be defined and measured in terms of genes, species, ecosystems, and landscapes?

- What are the impacts of human activity (including climate change) and natural catastrophes on biodiversity in Canada's forests? And, how can we alter these impacts to improve the conservation of biological diversity?
- What constitutes effective conservation of forest biodiversity? And, what are the socioeconomic implications of options for conserving biological diversity?

[Source: "Biodiversity in the Forest", Op. cit., p. 27]

5.2.3. Goals, Objectives, Strategies

Question 29: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

Goal Statement of Sustainable Forests: A Canadian Commitment

To maintain and enhance the long-term health of our forest ecosystems for the benefit of all living things, both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations.

Given the importance of forests to Canadians, and the diverse uses that occur in these areas, it is essential that integrated management practices continue to be improved and implemented. Management decisions must be based on our best understanding of forest ecosystems and the implications of various forest uses.

Governments, forestry companies, woodlot owners, conservation groups and other organizations and individuals are directing resources towards addressing forest issues. Research and new technologies are improving forest management practices. Greater effort is being directed at improving forest inventories and reducing adverse impacts on soil, water and wildlife. A variety of mechanisms, such as land-use planning, forest management plans and guidelines are being implemented to solve conflicts between users. Protected areas have been and will continue to be established in support of the conservation of forest biodiversity. In 1992, Canada's national forest strategy, Sustainable Forests: A Canadian Commitment, was published. Now being implemented, this strategy provides a framework for jurisdictions to address forest issues and realize opportunities. The Canadian Biodiversity Strategy does not repeat all of the elements of the national forest strategy, but rather attempts to build upon those elements that are most relevant to the objectives of the Biodiversity Convention.

The national forest strategy, Sustainable Forests: A Canadian Commitment, expresses a new vision for the future of Canadian forests. Biodiversity conservation and the sustainable use of biological resources are important themes throughout this national strategy, and action is taking place across the country to ensure that these aims are met.

[Source: Canadian Biodiversity Strategy, 1995, pp. 37-38]

Ontario's Policy Framework for Sustainable Forests

"Our goal is to ensure the long-term health of our forest ecosystems for the benefit of local and global environments, while enabling present and future generations to meet their material and social needs ...To ensure that [the] current biological diversity of forests is not significantly changed and, where necessary and practical, is restored"

[Source: Policy Framework for Sustainable Forests, A Statement of the Gov't of Ontario released on April 6, 1994]

5.2.4. Strategic Actions

Strategic Directions:

1.65 Assess current and proposed major government forest policies and programs to ensure that ecological, economic, social and cultural objectives have been considered.

1.66 Increase our understanding of forest biodiversity by enhancing ecological site classification systems and the inventory and monitoring of commercial and non-commercial species, soil, soil biota, climate and other biophysical characteristics.

1.67 Improve our understanding of forest ecological functions by determining the benefits of ecological services provided by forest ecosystems, monitoring the ecological responses of forests to resource management practices, and by carrying out other activities.

1.68 Eliminate or reduce to acceptable levels, the adverse impacts of forest management practices on watersheds, soils, adjacent ecosystems and species.

1.69 Continue to develop and implement improved forest management practices that provide for the sustainable use of forests while maintaining the regional forest mosaic. Use practices that are as consistent as is practical, with natural disturbance regimes, patterns and processes.

1.70 Provide improved training opportunities for forest scientists, managers and operators to increase their understanding of forest ecosystems.

1.71 Use integrated pest management approaches that eliminate or reduce to acceptable levels, adverse impacts on non-target species and ecosystems.

1.72 Inventory and evaluate forest ecosystems and species to ensure the conservation of natural biological control systems, and to identify species for use as biocontrol agents.

1.73 Develop and implement programs to conserve the genetic diversity of tree species in in situ conditions .

1.74 Establish and maintain forest seed and clonal gene banks to conserve the genetic diversity of tree species.

1.75 Allow fire, disease, succession and natural forest regeneration to maintain biodiversity, where they are compatible with forestry and other land use objectives, and where natural regeneration can be effective.

1.76 In consultation with regional and urban governments, landowners and lease holders, identify and correct policies that discourage the conservation of biodiversity and the sustainable use of forest biological resources on private lands and leased crown lands.

1.77 Where practical, restore or rehabilitate degraded forest ecosystems that will make a significant contribution to conserving biodiversity.

1.78 Establish protected areas to conserve representative and critical forest ecosystems as part of an overall network of protected areas in accordance with the strategic directions provided in the section on protected areas in this Strategy.

1.79 Develop and implement forest management plans and codes of practice to promote the sustainable use of forest ecosystems and the conservation of biodiversity.

1.80 Support research, management and policies that assess and promote new uses of timber and non-timber products from forests to increase the economic return from forest ecosystems, while conserving biodiversity.

[Source: Canadian Biodiversity Strategy, 1995, pp. 38-40]

Question 30: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

Through the National Forest Strategy, Canada meets its international commitments made in the 1992 United nations Conference on Environment and Development. Many of these action items encompass the conservation of forest

biological diversity and the sustainable use of biological resources as part of a comprehensive and holistic approach to the use and conservation of forests:

- completion of an ecological classification of forest lands;
- increased basic and applied research of forest ecosystems and their response to human activities;
- forest management guidelines to maintain biodiversity;
- inclusion of measures for conserving biodiversity in management plans;
- inclusion of measurable objectives for the state of the forest ecosystem in forest management plans;
- evaluation of local soil, climate, and wildlife conditions as part of planning for roads, harvesting and silvicultural practices;
- national reporting on the state of forest biodiversity;
- building on working definitions of forest biodiversity and old-growth forests; and
- completion of a network of protected areas representative of Canada's forests.

[Source: "Biodiversity in the Forest", Op. cit., p. 9]

5.3 Sustainable Use of Wild Life

5.3.1. Scope

A. Wild Flora and Fauna and Other Wild Organisms

The first element of the ecological management approach is to maintain populations of wild and native flora and fauna and other wild organisms, in their functioning ecosystems, landscapes and waterscapes. Results of conservation biology research indicate that the key to conserving species is to maintain viable populations across their natural geographic range.

In addition to ecosystem services, uses of wild flora and fauna and other wild organisms make a significant contribution to our economy. Millions of people spend billions of dollars participating in activities such as fishing, hiking, bird-watching, hunting and photography.

Wild floral and faunal resources are also valued for cultural or spiritual reasons. These values are difficult to describe in monetary terms, but they are real values contributing to the health and enjoyment of millions of people.

[Source: Canadian Biodiversity Strategy, 1995, pp. 19-20]

Question 31: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

5.3.2 Challenges, Issues and Opportunities

The ecological roles and economic importance of many plants, invertebrates, micro-organisms , fungi and other wild organisms are not fully understood. These lifeforms create and maintain soil, recycle nutrients and play a critical role in maintaining the balance of oxygen and carbon dioxide that affect climate and rainfall patterns. Wild flora and fauna and other wild organisms, and the ecological services they perform, have made it possible for humans to exist on Earth. In economic terms, ecosystem functions or services provide the foundation for economic activities that generate billions of dollars.

[Source: Canadian Biodiversity Strategy, 1995, pp. 20-21]

Quesiton 32: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

As a result of effective resource management, many populations of wild flora and fauna and other wild organisms are sustainable. However, some populations are declining, largely as a result of habitat loss or deterioration. For example, several species of waterfowl have seriously declined in number in the past 20 years as a

result of lost nesting cover, drainage of wetlands, and habitat modification along migration routes. Over-harvesting and poaching have also contributed to the decline of some species. Despite many examples of good resource management, there are still many species-at-risk in Canada.

[Source: Canadian Biodiversity Strategy, 1995, pp. 20-21]

5.3.3. Goals, Objectives, Strategies

Many policies and programs have been developed and are being implemented to manage ecosystems and species. In 1990, A Wildlife Policy for Canada was released by the Wildlife Ministers' Council of Canada. The goal of this policy is to maintain and enhance the health and diversity of wild flora and fauna and other wild organisms , both for their own sake and for the benefit of present and future generations.

[Source: Canadian Biodiversity Strategy, 1995, pp. 20-21]

Question 33: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

5.3.4. Strategic Actions

Strategic Directions

1.1 Use ecological planning and management approaches with more emphasis on landscape/waterscape-level planning to integrate economic and social objectives with biodiversity conservation objectives.

1.2 Conserve ecosystems and critical habitats to support populations of wild flora and fauna and other wild organisms.

1.3 Through research, increase our understanding of the status, genetic diversity and ecological relationships of species and populations to improve ecological planning and management.

1.4 Ensure that the harvest of wild flora and fauna and other wild organisms is sustainable and minimize adverse impacts of harvesting on non-target species.

1.5 Re-connect fragmented ecosystems where practical and necessary, providing corridors and protecting habitats for isolated species or populations.

1.6 Modify or eliminate elements of government policies and programs that create unintentional adverse impacts on wild flora and fauna and other wild organisms on private and public property.

1.7 Strengthen measures to reduce and eliminate the release of substances, or quantities of substances, that are harmful to ecosystem, species and genetic resources.

1.8 Ensure that both economic and ecological factors are considered in designating pests and in implementing pest management strategies.

1.9 Develop indicators to monitor trends and support the management of wild populations, species, habitats and ecosystems.

1.10 Maintain or improve measures that prevent in situ populations from becoming jeopardized by specimen collecting for ex situ conservation and other purposes. (When only a single population of a species exists and it is in a highly endangered state, it may be necessary to move all of its members to ex situ conservation facilities in order to build up its numbers and eventually re-establish in situ populations).

1.11 Foster the participation of non-government ex situ conservation experts and institutions in in situ conservation efforts, and improve the participation of government agencies in non-government ex situ conservation efforts.

1.12 Implement mechanisms to conserve and use in a sustainable manner transboundary native wild populations, species, habitats and ecosystems in

Question 34: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

cooperation with other countries and organizations.

[Source: Canadian Biodiversity Strategy, 1995, pp. 21-22]

1.1 Sustainably manage the harvest of all wild species within an ecosystem context.

- Examine the policy or legislative needs to address the harvest of wild plants: 2005
- Complete Forest Ecosite Classification to provide a coarse level inventory of wild plants of interest for harvest in the provincial forest: 2006
- Complete risk analysis for the harvest of wild plants and non-game wildlife including management recommendations: 2007;
- Implementation of recommendations on a priority basis: 2008
- Continue to manage the harvest of game species to minimize ecosystem impacts: Ongoing

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, government of Saskatchewan, p.11]

5.4 Sustainable Agriculture

5.4.1 Scope

The agriculture and agri-food industry is a major contributor to the Canadian economy, accounting for eight percent of the Gross Domestic Product and 15 percent of total employment. Approximately seven percent of Canada's total land base is under some form of agricultural production, with one half million farmers engaged in primary food production worth $18 billion annually. Over one million individuals are employed in the food processing sector, which in 1992 was the second largest manufacturing industry in Canada, worth a total of $43.6 billion.

[Source: Canadian Biodiversity Strategy, 1995, pp. 31-32]

Question 35: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

5.4.2 Challenges, Issues and Opportunities

Just as humans depend upon the products of agriculture, agriculture depends upon biological resources and ecosystems that provide the raw materials to produce new and better food plants, breeds of animals, and other products.

International access to diverse genetic resources is necessary for us because almost all major Canadian crops and domestic animals originated in other parts of the world. We must continue to be involved in global cooperative efforts in conservation and germplasm exchange in order to maintain a broad genetic base that will ensure our competitive position in the international market place.

Genetic resources can be preserved in specialized facilities, on farms or in the wild. In Canada, ex situ preservation plays a critical role in providing continued access to viable seed stocks and cell lines, that would otherwise be lost as wild populations and species and traditional crops and breeds change or become extinct. Efforts are underway in Canada to preserve rare breeds of domesticated plants and animals in on-farm conditions.

On a broader scale, the impact of agriculture on other aspects of biodiversity has been recognized and, in many cases, solutions have been identified and are being implemented. Governments, agricultural producers, conservation organizations and others are addressing problems associated with soil erosion, the chemical contamination of water, wetland drainage, urban encroachment, wildlife and

Question 36: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

habitat impacts, energy efficiency, air and climate influences, pollution and waste management. In 1991 it was estimated that 87% of Canada's original prairie grassland had been converted to farmland. Canada has established Grasslands National Park to maintain a representative example of the arid shortgrass grassland region.

There is growing recognition within the farm sector that agriculture can benefit, in certain circumstances, from the maintenance and enhancement of populations of wild flora and fauna. Governments are funding research and technology transfer programs to assist farmers in adopting practices that minimize impacts on surrounding ecosystems. Efforts must continue to optimize the use of agricultural lands by determining the most suitable crops for particular soil types and other conditions. Optimizing the use of agricultural lands is not only an essential element of agricultural sustainability, but also can significantly contribute to the conservation of biodiversity by maintaining or enhancing crop production without expanding the agricultural land base.

It is essential that individual landowners and agricultural producers continue to be involved in the development and implementation of environmentally sustainable agricultural policies and programs.

Environmental Farm Plans

The Ontario Farm Environment Coalition is pro-actively dealing with environmental issues facing agriculture. Their agenda, developed in consultation with 28 major Ontario farm organizations, forms the basis for the voluntary Environmental Farm Plan process. The Environmental Farm Plan identifies areas of potential environmental concern and promotes realistic goals to minimize these concerns. This includes the need to make reasonable efforts to conserve Ontario's natural biodiversity, while recognizing the requirements of working farms. As the application of this process increases, it is expected that the conservation of Ontario's natural biodiversity in agricultural landscapes will be improved.

[Source: Canadian Biodiversity Strategy, 1995, pp. 31-34]

The Government of Ontario will translate its vision for growth into a concrete plan to guide decisions on a wide range of issues - land-use planning, urban development, housing, local services, transportation and environmental infr structure and economic development. We will ensure that better investment decisions are made that will get the results we want for the prosperity of the Greater Golden Horseshoe. To provide a provincial vision and strategy for managing growth in the region over the next 30 years we will:

Decide where we want to grow by identifying priority urban centres, strengthening the transportation linkages among them, and encouraging more compact development in urban areas to maximize the benefits of new growth. Protect and manage valuable greenlands, natural systems and agricultural lands so that they continue to contribute a full range of environmental, social and economic benefits to Ontario.

[Source: Places to Grow, Government of Ontario, 2004]

5.4.3. Goals, Objectives, Strategies

24.1.4 ensure compatibility between biodiversity and agriculture, with key priority areas being habitat availability, species at risk, and economic damage to agriculture from wildlife.

[Source: FEDERAL-PROVINCIAL-TERRITORIAL FRAMEWORK AGREEMENT ON AGRICULTURAL AND AGRI-FOOD POLICY FOR THE TWENTY-FIRST CENTURY , p. 17]

Question 37: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

5.4.4. Strategic Actions

Strategic Directions

1.39 Assess current and proposed major government agricultural policies and programs to ensure that ecological, economic, social and cultural objectives are considered.

1.40 Maintain, adjust or develop economic incentives that promote the conservation of biodiversity and sustainable use of biological resources on agricultural lands.

1.41 Inventory and evaluate genes, populations, species and ecosystems to ensure the conservation of natural control systems and the identification of species for use as biocontrol agents.

1.42 Develop and use agricultural pest-control products and integrated pest management approaches to minimize negative impacts on non-target ecosystems and those species approaching or already at risk.

1.43 Conserve biological resources that are essential to agriculture, including domesticated animals, plants and microbial germplasm, and their wild relatives, with priority given to genetic material that is most at risk.

1.44 Develop and implement programs that promote and facilitate the co-existence of wild flora and fauna and other wild organisms and their habitats in agricultural landscapes.

1.45 Through research, training and technology transfer, facilitate the further adoption of environmentally sustainable farm practices, including those that:

a) reduce soil erosion, surface and ground water contamination and air pollution; and

b) lead to the identification of productive soil types in relation to specific crop requirements.

1.46 Encourage agricultural producers to develop farm management plans that support the conservation of biodiversity and the sustainable use of biological resources.

1.47 Facilitate the sharing of experiences and expertise among farmers to promote management practices that favour the conservation of biodiversity and the sustainable use of biological resources.

1.48 Maintain or develop policies or programs that conserve biodiversity by supporting the sustainable use of native grasslands.

1.49 Identify and conserve areas that support native species and communities or could contribute to systems of protected areas, especially in intensively developed areas in accordance to the directions provided in the section on protected areas of the Strategy.

1.50 Maintain or develop in situ and ex situ conservation mechanisms to support the conservation and sustainable use of biological resources essential to agriculture by:

a) determining and acting upon regional, provincial, territorial, national and international priorities for the conservation of biological resources, research and training, and the establishment of facilities; and

b) continuing to support existing federal, provincial, territorial, regional and international ex situ institutions.

[Source: Canadian Biodiversity Strategy, 1995, pp. 32-33]

24.2.1 the completion of a basic agri-environmental scan on all farms so as to identify farms and regions requiring corrective action;

Question 38: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

24.2.2 the completion of an agri-environmental farm plan or participation in an equivalent agri-environmental plan for all farms identified as requiring significant corrective action under the basic agri-environmental scan referred to in clause 24.2.1; and

24.2.3 the implementation of agri-environmental farm plans or equivalent agri-environmental plans and improved stewardship through the adoption of environmentally beneficial practices, as appropriate to the needs and circumstances of individual farms or regions, in the following areas:

24.2.3.5 increase the use of management practices that promote compatibility between agriculture and biodiversity, and minimize economic damage from wildlife to agriculture.

[Source: FEDERAL-PROVINCIAL-TERRITORIAL FRAMEWORK AGREEMENT ON AGRICULTURAL AND AGRI-FOOD POLICY FOR THE TWENTY-FIRST CENTURY , pp. 17-18]

5.5 Human Population and Settlement

5.5.1 Scope

Question 39: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Life on Earth depends on the atmosphere. Past changes in the atmosphere have caused significant shifts and mass extinctions. The current climate, with its variability and extremes, directly affects all ecosystems. Future global atmospheric changes resulting from human activities may exert the greatest influence on biodiversity. Atmospheric pollutants (greenhouse gases, toxic air pollutants, ozone depletion chemicals) are giving rise to climate change, increased ultraviolet light penetration, and stress on human and biodiversity well-being. It is not known how ecosystems and species will adjust or fail to adjust to these stresses, or what the potential effect on genetic diversity will be. Canada's northern ecosystems may be especially vulnerable to the impacts of a changing climate.

[Source: Canadian Biodiversity Strategy, 1995, pp. 43-44]

The capacity of Earth to support an ever-growing human population and satisfy increasing demands on its resources is limited. If the present human population of 5.6 billion continues to grow at current rates, it could reach 12 billion by 2050.

In addition to human population growth, high consumption rates, particularly in developed countries, are stressing global ecosystems and influencing atmospheric systems. Canada's per capita rate of water and energy consumption and waste generation is among the highest in the world.

[Source: Canadian Biodiversity Strategy, 1995, p. 45]

Canada is one of the most urbanized nations in the world. In 2001, 79.4% of the Canadian population lived in urban areas with a population of 10,000 or more. While the average national growth rate is 4%, 11 of Canada's 27 census metropolitan areas had a growth rate more than double the national average. By 2020, it is estimated that Canada's population will be approximately 36 million, that 85-90% of Canadians will live in urban areas, and that Canada's 6 largest cities will be home to more than 50% of the total population.

How cities are organized affects the quality of the environment both within and beyond their borders. Factors such as where people live and work, how they get there, the types of municipal infrastructures and services, and the way in which a community grows and changes each have a significant impact. With the majority of Canadians living in cities or affected daily by them, many personal

contacts with wild species are in urban areas. As a result, Canadian attitudes towards biodiversity may also be affected significantly by the ecosystems found in urban areas.

The Human Population and Settlement section of the Canadian Biodiversity Strategy contains several broad strategic directions in support of the conservation of biodiversity in settled landscapes, including points related to planning, codes of environmental management, carrying capacity, resource consumption, and lifestyle choices.

[Source: Excerpt from "Urban Biodiversity", Biodiversity Convention Office, Environment Canada website at http://www.bco.ec.gc.ca/en/primers/urban.cfm]

5.5.2 Challenges, Issues and Opportunities

Question 40: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

Conserving Forests and prairie grass lands...Not only supports the conservation of biodiversity but also removes gases from our atmosphere that have been linked with climate change.

Strong linkages between biodiversity issues and atmospheric change were emphasized at the Earth Summit in 1992, when the Convention on Biological Diversity and the Framework Convention on Climate Change were signed by most United Nations countries. Both conventions arose from a common concern that human activities were endangering life-support systems. The objectives of these conventions are complementary. For example, conserving forests and prairie grasslands or providing permanent cover in agricultural areas not only supports the conservation of biodiversity but also removes gases from our atmosphere that have been linked with climate change.

National and international research and development efforts aimed at addressing atmospheric issues have been underway for more than a decade. A National Air Issues Coordinating Committee, formed to address air quality issues, has established task forces to develop a National Action Plan on Climate Change as well as strategies to eliminate, reduce or control smog, acid precipitation, and hazardous air pollutants. A national emissions and forecasting working group has also been created to update Canada's inventory of substances that are known to affect atmospheric conditions.

In Canada, human settlement has already had a significant adverse impact on ecosystems, species and genetic diversity. Farming, forest development, commercial fishing, urban development, mining, oil and gas use and development, the development of transportation infrastructure and other activities have each had varying degrees of impact on our resources.

The effect of human settlement on biodiversity is most evident in the southern part of the country, where urban development has been concentrated, native grasslands have been converted to cropland and wetlands drained. Not surprisingly, most of Canada's endangered species are concentrated in the areas of southern British Columbia, the southern prairies and the Quebec City-Windsor corridor where 75% of Canada's population lives.

Ecosystem degradation has also contributed to the decline of biodiversity. Degradation has resulted from pollution, the introduction of harmful alien organisms, and habitat fragmentation caused by such activities as forest and agricultural developments, highways and urban sprawl. Lakes in eastern Canada have suffered from acid precipitation, and the Great Lakes, St. Lawrence River, Fraser River Basin and Atlantic and Pacific fisheries are all under ecological stress resulting directly and indirectly from human activities.

In response to concerns about human impacts on the environment, governments, communities, businesses, educational institutions and individuals are taking ac-

tion. Numerous programs have been implemented to reduce energy use, conserve water, recycle material, manage hazardous waste and reduce pollution emissions. These types of actions must be continued to conserve biodiversity and support the sustainable use of biological resources.

[Source: Canadian Biodiversity Strategy, 1995, pp. 43-46]

Green infrastructure is our nation's natural life support system — an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks and other conservation lands; working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute to the health and quality of life for America's communities and people. (p. 6)

Consequences of Haphazard Development

Over the past several decades, growth has leapfrogged beyond cities and older suburbs into many areas that were once rural. Today development is converting farms and forests to other uses at an increasingly rapid rate. Too often, this is done without firm land-use plans in place to guide development. The result is urban sprawl. Human modifications of the land have created fragmented development patterns that threaten native plant and wildlife communities and associated ecological functions and processes. This has led to:

Loss of Natural Areas

Developing land for houses, roads and other human needs reduces the amount of natural areas. For example, about 25,000 acres of wetlands continue to be lost each year to sprawl. As natural areas diminish, so does habitat diversity. The result is both a decline in the number of species and fewer individuals of those species that survive.

Fragmentation of Natural Spaces

As we convert land, we fragment it into smaller and more isolated patches of open space, which greatly alters the way in which natural systems function. Fragmentation increases edge habitat and the isolation between patches while reducing the number and diversity of natural plant and animal species.

Degradation of Water Resources

Developing wetlands and riparian zones reduces their capacity to control floods, trap sediments, filter out toxins and excess nutrients, and support wildlife and plant species, and it threatens the health of the environment.

Decreased Ability for Nature to Responsd to Change

Development has hindered nature's ability to respond to climatic changes and has reduced population viability for wildlife by reducing genetic diversity and limiting wildlife movement. In addition to these ecological effects, there are also social and economic consequences of the consumption of open lands and the resulting loss of green space. These include:

Loss of "Free" Natural Services

Natural systems provide important services, such as flood control, stormwater management and the filtration of pollutants. The loss of natural systems increases

the risk of flooding and natural disasters. This, in turn, costs communities billions in mitigation efforts and in disaster relief and recovery.

Increased Costs of Public Services

Haphazard development often increases the cost of public services by requiring huge investments in new roads, sewers, schools and other public infrastructure.

In addition, the loss of farm and forestlands affects a community's bottom line. Many studies show that farming and forestry generate considerably higher revenue than the amount of public services they require. Residential development has the opposite effect. Urban sprawl and the inefficient use of land and resources require communities to provide services across a larger geographic area. Because developments and buildings are spread further apart, sprawl stretches municipal services, resulting in scarcer water and higher taxes.

[Source: Green Infrastructure: Smart Conservation for the 21st Century, Mark A. Benedict, Ph.D and Edward T. McMahon, J.D. Website: www.sprawlwatch.org]

5.5.3. Goals, Objectives, Strategies

Question 41: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

G. Human Population and Settlement

Canadians are becoming increasingly aware of the adverse impacts of human activities and resource consumption patterns on ecological, economic, social and cultural systems. Thus, human population policies must be developed to reflect societal objectives and ecological carrying capacity.

[Source: Canadian Biodiversity Strategy, 1995, p. 45]

Theme : Cities, Towns and Villages

Objective:

34. Promote among the municipalities the creation of municipal strategies, policies or programs for greening and urban forest development, integration of parks and green spaces into a continuous green belt, and restoration of the shores of lakes and waterways in urban areas.

Result Indicator: Number of municipalities with strategies, policies or programs for development in these areas

Objective:

35. Reduce the use of pesticides in urban areas

Result Indicator: Annual amount of pesticides sold in Quebec

Objective:

36. Minimize the encroachment of urbanization on important agriculture and forest land, rivers, coastlines and flood plains; ensure, if expansion is inevitable, that it is carried out in such a way as to have the least possible impact.

Result Indicator:

- Total area of agricultural land converted to urban use
- Number and total area of forest lands converted to urban use
- Number of authorized expansions, and the total area of urban expansion on rivers, coastline and flood plains

[Source: Excerpt from: "Maintaining Biodiversity for the Sustainable Development of Quebec", Draft Quebec Strategy on Biological Diversity, 2002-2007 (2002)]

Discussion "Starters" and Samples

Your views/thoughts/comments

5.5.4. Strategic Actions

Strategic Directions:

1.85 Develop linkages in the implementation processes for the Conventions on Biological Diversity and Climate Change and other atmospheric agreements and programs.

1.86 Maintain and enhance bioclimatic monitoring to track the effects of atmospheric changes on ecosystems, species and genetic diversity.

1.87 Increase coordination among national programs to determine potential impacts on biodiversity from past, present and future atmospheric changes.

1.88 Apply multi-disciplinary research to investigate relationships between atmospheric changes and changes in biodiversity.

1.89 Implement measures to eliminate or reduce human-caused atmospheric changes that adversely affect biodiversity.

1.90 Use a variety of planning and approval mechanisms that provide for meaningful public and stakeholder participation to prevent or reduce negative impacts on biodiversity that may arise from human settlement activities.

1.91 Develop and implement educational and incentive programs to encourage biodiversity conservation on private lands.

1.92 Promote the acceptance of the requirements of the Convention within the urban development sector through the voluntary establishment of codes of environmental management and the provision of relevant biodiversity education material.

1.93 Determine and mitigate, where practical, incremental and cumulative impacts of human activities on ecosystems and biological resources.

1.94 Support research on ecological carrying capacities and the way that changes in biodiversity, human population density, land and resource development and resource consumption patterns and rates affect one another.

1.95 Reduce resource consumption by promoting initiatives based on the "three R's" - reduce, reuse and recycle - and by increasing awareness of the value of biodiversity and the lifestyle choices that cause its decline.

1.96 Work through appropriate national and international organizations to improve dialogue and communication and to encourage research on the linkages among population, social issues, consumption and production of resources and ecological carrying capacity in order to formulate sustainable development policies.

2.15 Design and implement improved ecological planning and management at the landscape/waterscape level to conserve biodiversity and use biological resources in a sustainable manner.

2.16 Improve ecological planning to assist in the conservation of biodiversity and the sustainable use of biological resources, especially in or near sensitive aquatic areas, in areas that support populations of endemic, threatened or endangered species, and in areas that are undergoing significant changes resulting from human activity and development.

2.17 Use ecological or land-use planning to help identify and establish protected areas and to ensure that the ecological integrity of established protected areas is maintained.

2.18 Strengthen planning processes to work toward the conservation of biodiversity and the sustainable use of biological resources of internationally-shared ecosystems and trans-boundary rivers and aquatic ecosystems, such as the Great Lakes and the St. Lawrence River.

2.19 Strengthen international planning efforts and other processes to eliminate or reduce adverse impacts on biodiversity and the sustainable use of bio-

Question 42: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

logical resources, resulting from activities in other countries, with special consideration placed on migratory species, aquatic ecosystems and airborne pollutants.

2.20 Use environmental assessments to determine potential impacts of developments on ecosystem, species and genetic resources and to recommend appropriate ways to avoid or reduce them to acceptable levels.

2.21 Continue to examine and develop ways to harmonize environmental assessments nationally and internationally, where appropriate.

2.22 Enhance efforts to determine and eliminate or reduce to acceptable levels, cumulative environmental effects that result from human activities on ecosystems, species and genetic diversity. This includes developing early-warning indicators and working towards incorporating cumulative environmental effects into relevant national and international agreements.

2.23 In cooperation with other countries, maintain or develop environmental disaster prevention plans, procedures and other measures, and respond to events that pose grave and imminent risk to national, international and trans-boundary biodiversity.

2.24 Maintain or develop arrangements to notify and respond with appropriate action to events originating in Canada that could significantly affect the biodiversity of other countries.

[Source: Canadian Biodiversity Strategy, 1995, pp. 44-46]

5.6 Genetic Resources

5.6.1. Scope

Living Modified Organisms

Living modified organisms resulting from biotechnology offer the potential for important economic and social benefits as well as a means to address existing ecological problems affecting biodiversity. However, these organisms also have the potential to adversely affect populations, species and ecosystems.

[Source: Canadian Biodiversity Strategy, 1995, p. 43]

Question 43: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Access and Benefits Sharing

Until recently, all plants, animals and microorganisms were considered to be part of the common heritage of humankind. Foreign prospectors felt free to take these biological resources from their countries of origin and use them to develop drugs and other commercial products. The resulting products would be sold by foreign companies under the protection of patents or other intellectual property rights. Meanwhile, the country of origin - often from the developing world, where most biodiversity is found - would receive no benefit from the commercial exploitation of its resources.

Under the Convention on Biological Diversity, the international community has agreed that all States have sovereignty over their own genetic resources and are thus entitled to the "fair and equitable sharing of the benefits" that these resources provide. Governments are committed to facilitating access to genetic resources on "mutually agreed terms" and on the basis of the country of origin's "prior informed consent". This country has the right to benefit from the exploitation of its resources in the form of financial payments, samples of what is collected, the participation or training of national researchers, the transfer of biotechnology equipment and know-how, or a share of any profits from the use of the resources.

5.6.2 Challenges, Issues and Opportunities

Conservation and Exchange of Forest Genetic Resources

One of the three major objectives of the Convention on Biological Diversity is "the fair and equitable sharing of the benefits arising out of the utilization of genetic resources." Benefit sharing and access issues concerning forest genetic resources are not a major public issue in Canada, but are highly contentious at the international level. Developing nations charge that their tropical forests are being exploited for genetic resources for food and pharmaceutical uses without proper compensation, and some are restricting access to these resources.

There is comparatively little demand for access restrictions on forest genetic resources for timber production. Canada is the country of origin for several conifer species that are widely planted abroad (especially in Europe). Seeds of these Canadian species are exchanged openly among researchers and are exported in small quantities for commercial purposes. Most countries now have their own domestic seed orchards for producing these species. Canada has a national institution where tree seeds and other forest genetic materials are stored, and most Canadian provinces have their own seed banks, seed orchards, provenance trials, and other ex situ facilities for important commercial tree species.

[Source: "Biodiversity in the Forest", Op. cit., p. 21]

Question 44: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

5.6.3. Goals, Objectives, Strategies

Goal 3. Promote the conservation of genetic diversity

Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

Possible Indicator: Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance

[Excerpt from: 2010 Biodiversity Target, Convention on Biological Diversity website at http://www.biodiv.org/2010-target/default.asp]

Question 45: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

Objective 4.1 Conservation of New Zealand's genetic resources

Conserve the diversity of New Zealand's genetic resources so as to maintain their current and potential benefits to New Zealanders.

Objective 4.2 Access to genetic material from other countries

Maintain access by New Zealanders to genetic material from overseas, and participate in international frameworks relating to access to genetic resources and related knowledge and technology.

Objective 4.3 Bioprospecting in New Zealand

Develop an integrated policy and legislative framework for managing bioprospecting in New Zealand, including arrangements for sharing benefits from the use of genetic resources, which are consistent with international commitments.

Objective 4.4 Matauranga Maori and use of genetic resources

Ensure that the use of matauranga Maori (traditional knowledge) in the identification and commercial use and development of intellectual rights to indigenous

genetic resources occurs only with the consent of the holders of that knowledge, and that they share in any subsequent benefits (see Theme Seven).

Objective 4.5 Conservation of threatened introduced species

Assist with international efforts to conserve threatened introduced plants and animals in New Zealand, provided that this does not conflict with conserving indigenous biodiversity.

[Source: Excerpts from: The New Zealand Biodiversity Strategy, website at http://www.biodiversity.govt.nz/picture/doing/nzbs/index.html]

5.6.4. Strategic Actions

Strategic Directions

1.83 Prevent the introduction of potentially harmful living modified organisms by:

a) ensuring that there is adequate legislation and enforcement to control introductions or escapes of harmful living modified organisms, and improving preventative mechanisms such as screening standards and risk assessment procedures; and

b) developing national and international database capacities that enable Canada to identify and anticipate the introduction of potentially harmful living modified organisms.

1.84 Promote research into methods and approaches that improve our ability to assess whether or not living modified organisms will have an adverse impact on biodiversity.

[Source: Canadian Biodiversity Strategy, 1995, p. 43]

Question 46: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

Actions:

a) Develop a collaborative strategy to manage New Zealand's genetic resources (from both introduced and indigenous species), focusing on:

i. effective cooperation between Government, industry, research institutions and managers of collections of genetic resources;
ii. clearly assigning responsibilities for maintaining New Zealand's genetic resources; and
iii. managing information about collections of genetic resources.

b) Identify significant areas of risk in the management of the genetic resources of New Zealand's introduced species, including information gaps, and recommend how these risks can be effectively managed.

c) Identify significant areas of risk in managing genetic resources of New Zealand's indigenous species that are threatened or in decline (with reference to threatened species recovery programmes), and recommend how these risks can be reduced, for example through germplasm banks.

Actions:

a) Implement the HSNO Act to ensure ongoing access by New Zealand to genetic material from overseas, while safeguarding indigenous biodiversity and human health.ecies recovery programmes), and recommend how these risks can be reduced, for example through germplasm banks.

b) Review arrangements for collecting genetic resources overseas, by New Zealand individuals, companies and research institutions, and conclude agreements as appropriate45.

c) Continue to participate in renegotiating the International Undertaking on Plant Genetic Resources, and participate in relevant future multilateral or bilateral agreements for access to genetic resources for food and agriculture.

d) Participate in multilateral and bilateral processes relating to access to genetic resources (not limited to genetic resources for food or agriculture) within the Convention on Biological Diversity framework.

e) Continue to develop cooperative research programmes and share information about genetic resources between New Zealand institutions, institutions in other countries, and international bodies.

Actions:

a) Develop policy on access to, and the use of, New Zealand's indigenous genetic resources and the sharing of benefits from their use, taking into account Maori interest in these resources (see Theme Seven) and providing as much certainty as possible for all parties.

b) Review existing controls and legislation regulating the bioprospecting of indigenous genetic resources, with a view to developing a more integrated framework for managing bioprospecting and distributing its benefits46.

Actions:

a) Address, and seek to resolve, Treaty of Waitangi claims to ownership of biological resources, including indigenous genetic resources.

b) Develop agreements that safeguard the use of matauranga Maori in the identification, use and development of intellectual rights to indigenous genetic resources, and ensure appropriate sharing of resultant benefits.

c) Provide for Maori interests in indigenous genetic resources, and concerns relating to the patenting of lifeforms, to be taken into account during the current review of the Patents Act 1953.

Actions:

a) Support the in situ conservation of threatened introduced species by returning them, where possible and environmentally desirable, to their place of origin.

b) Maintain small populations of threatened introduced species in facilities or clearly defined areas where their presence will not pose a threat to indigenous species, where reintroduction to their country of origin is not feasible or is undesirable because of the risk of introducing pests or diseases.

[Source: Excerpts from: The New Zealand Biodiversity Strategy, website at http://www.biodiversity.govt.nz/picture/doing/nzbs/index.html]

6.0 Supporting Strategies

6.1 Science, Information and Traditional Ecological Knowledge

6.1.1. Scope

Research

In order to develop an ecological approach to the management of resources, it is necessary to better understand ecosystems and to determine the impacts of human use of resources on biodiversity. An effective research agenda for biodiversity must be coordinated and prioritized.

Research can lead to new uses of biological resources, identify new opportunities for conservation incentives, and provide the basis for further economic diversification and investment.

[Source: Canadian Biodiversity Strategy, 1995, p. 47]

Question 47: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Traditional Knowledge

Many communities, families and individuals have accumulated traditional knowledge that is relevant to the conservation of biodiversity and the sustainable use of biological resources. This knowledge may relate to harvesting resources, planting crops, using natural herbs and other material for medicinal purposes, and understanding changes that have occurred to local biological features and landscapes.

Traditional knowledge can provide an excellent basis for developing conservation and sustainable use policies and programs. All too often, however, traditional knowledge is inappropriately used or disregarded by policy-makers, scientists, resource planners and managers.

Occasionally the holders of traditional knowledge are reluctant to pass on information to individuals who are not members of their community. They may be concerned that this information will be used inappropriately or without their permission.

[Source: Canadian Biodiversity Strategy, 1995, p. 48]

Inventories: Landscape, Species and Genetic Levels

Comprehensive and reliable biological inventories are a fundamental requirement for the conservation of biodiversity and the sustainable use of biological resources. They provide the foundation for:

- determining the status of ecosystems, species and genetic resources;
- setting sustainable harvest rates for biological resources;
- conducting research;
- developing resource- and land-use plans; and
- assessing the impacts of resource management practices on ecosystems.

[Source: Canadian Biodiversity Strategy, 1995, p. 49]

B. Increasing Resource Management Capability

Data and Information Management

Many government and non-government agencies collect data and information necessary for the conservation of biodiversity and the sustainable use of biological resources. However, collected data and information are often not avail-

able because of exchange problems between management systems or because individuals are not aware of potentially useful sources. Also, the full range of data including biological, physical, chemical, social, cultural and economic data, required by resource planners and managers is often unavailable. Effective management systems are required to ensure data and information are available to those who need it.

[Source: Canadian Biodiversity Strategy, 1995, p. 52]

C. Monitoring

Monitoring programs are required to detect and measure changes in biodiversity, to better understand functional linkages in ecosystems, and to evaluate the success or failure of biodiversity conservation and sustainable use policies and programs.

[Source: Canadian Biodiversity Strategy, 1995, p. 57]

6.1.2 Challenges, Issues and Opportunities

Question 48: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

In Canada many kinds of biological inventories are conducted at the landscape and ecosystem levels. They are used to develop macro-scale policies and plans, regional land-use plans, forest management plans and frameworks for selecting protected areas.

Most of Canada's trees, flowering plants, mammals, birds, fish, reptiles and amphibians are relatively easy to observe and have, therefore, been discovered, named and classified. At the species level, many resource agencies have well developed inventories, especially for harvested species. Wildlife agencies routinely survey game species such as ducks, geese, deer and moose. Forest agencies inventory commercially valuable tree species. Species that have a potentially negative impact on commercial crops are also surveyed so that agencies and individuals can predict and prevent or reduce damage. However there are large gaps in our knowledge of organisms that are more difficult to observe and classify, such as viruses, bacteria, fungi, protists and insects. Scientists estimate that only 50 percent of Canada's species have been discovered, named and classified.

We cannot even estimate the number of species of organisms on Earth to an order of magnitude, an appalling situation in terms of knowledge and our ability to affect the human prospect positively. There are clearly few areas of science about which so little is known, and none of such direct relevance to human beings.

[Source: Peter H. Raven, Global Biodiversity Strategy]

The genetic diversity of the Earth's flora and fauna is very poorly understood. Even within institutions such as gene banks, which were expressly established to conserve economically important genetic resources, the genetic diversity of these resources has hardly been studied.

Inventory work requires highly skilled and trained personnel. There is currently a shortage of taxonomists and biosystematists - experts who identify and describe species. Moreover, very few university students are entering these fields, making it very difficult to replace retiring scientists.

Priorities need to be set to address gaps in our biological and biophysical data base. Landscape/waterscape-level inventories will be effective in supporting the development of land-use and resource management policies and plans, while more detailed inventories will be required to support more refined planning and site-specific developments. Inventories must be designed to achieve specified objectives.

[Source: Canadian Biodiversity Strategy, 1995, p. 50]

There are currently many monitoring programs underway, including programs that monitor water and air quality, wildlife population and species trends, climate, disease outbreaks, fire and successions. Monitoring is conducted by government and non-government agencies, often independently of each other.

Instances in which species and ecosystems are significantly affected by human activities are on the rise. For example, industrial and domestic acid emissions have increased atmospheric acidity, which, through deposition, has affected the acidity of thousands of water bodies and altered the habitat of many aquatic species. Effective monitoring programs must be integrated and ecologically-based in order to determine and implement appropriate management practices.

[Source: Canadian Biodiversity Strategy, 1995, p. 57]

6.1.3. Goals, Objectives, Strategies

Question 49: What goals/ objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

Article 12:

b) Promote and encourage research which contributes to the conservation and sustainable use of biodiversity.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 47]

Indigenous Knowledge, Innovations and Practices

Article 8:

j) Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant to the conservation and sustainable use of biodiversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 48]

Inventory of Biodiversity

Article 7:

a) Identify components of biodiversity important for its conservation and sustainable use.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 49]

Data Management

Article 7:

d) Maintain and organize by any mechanism data derived from identification and monitoring activities....Convention on Biological Diversity

Enhanced coordination among agencies and individuals could solve many data and information communications problems, although access to some information may need to be restricted in order to protect certain populations, species or sites.

[Source: Canadian Biodiversity Strategy, 1995, p. 52]

Monitoring

Article 7:

b) Monitor, through sampling and other techniques, the components of biodiversity... paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use.

c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biodiversity and monitor their effects through sampling and other techniques..... Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 57]

Objective 4.1

Provide the knowledge and understanding of Australia's biological diversity essential for its effective conservation and management.

[Source: National Strategy for the Conservation of Australia's Biological Diversity, Op cit. Section 4, page 1 of 4]

6.1.4 Strategic Actions

Question 50: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

2.1 Focus research to improve policy development and to integrate multiple land and resource-use objectives, with emphasis on:

a)increasing our understanding of the impacts of human use on ecosystems and biological resources;

b) providing support for multi-disciplinary or system-based research that improves the integration of social, economic and environmental policies;

c) developing methodologies that permit an improved valuation of biodiversity;

d) developing and implementing issue identification measures and adaptive management techniques to enhance management performance; and

e) developing and implementing conflict resolution models to resolve conflicts between various resource users.

2.2 Focus research to increase our understanding of ecosystems and our ability to manage human use of ecosystems and resources by:

a) examining the structure, function and composition of ecosystems, landscapes and waterscapes and the ecological services they provide;

b) developing cost-effective biodiversity inventory and monitoring methods and programs, including rapid assessment procedures and biodiversity indicators , to detect and monitor changes to ecosystems, species and genetic diversity;

c) evaluating and improving methodologies to determine sustainable resource use levels;

d) improving in situ and ex situ conservation methods, especially to enhance the recovery or rehabilitation of populations, species or ecosystems that are at risk; and

e) exploring new sustainable uses of biological resources for economic applications.

[Source: Canadian Biodiversity Strategy, 1995, pp. 47-48]

Strategic Directions:

2.3 Identify mechanisms to use traditional knowledge, innovations and practices with the involvement of the holders of such knowledge, innovations and practices, and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices.

[Source: Canadian Biodiversity Strategy, 1995, p. 49]

Strategic Directions:

2.4 Improve biophysical inventories at ecosystem, species and genetic levels by:

a) developing and applying regionally integrated landscape-level classification systems for terrestrial, freshwater and marine areas to provide a framework for the collection of information and the management of resources;

b) linking biological inventories and soil, climate and other surveys;

c) conducting biological inventories, based upon jurisdictional priorities, that take into consideration vulnerable, threatened and endangered species and ecosystems, critical habitats, little-studied taxonomic groups, taxonomic groups of economic importance, areas of high diversity and areas where human development and disturbance are the most significant; and

d) encouraging the use of innovative and traditional methods to increase knowledge about the diversity of micro-organisms, their functional roles in ecosystems, and their potential economic uses.

2.5 Enable agencies and individuals to conduct biological and biophysical inventories by:

a) developing ways to collectively identify funding sources and determine priorities for inventories; and

b) ensuring that there is sufficient expertise available to conduct inventory work, including taxonomists, biosystematists, parataxonomists, museum professionals, ecologists, geneticists and other experts.

2.6 Support efforts to improve the reliability and cost-effectiveness of biological inventory methodologies and technologies.

2.7 Maintain the capacity of museums and other institutions to scientifically describe, classify and store collected specimens, as well as maintain their ability to effectively disseminate data and information.

2.8 Continue to establish networks of Conservation Data Centres or Natural Heritage Centres to develop and harmonize data bases for the conservation of vulnerable, threatened and endangered species and ecosystems.

2.9 Improve inventories to determine the genetic diversity of domesticated and non-domesticated biological resources to maximize the conservation and economic use of genetic resources.

2.10 Collaborate with other countries to inventory populations and habitats of transboundary species, particularly those that are at risk

[Source: Canadian Biodiversity Strategy, 1995, pp. 51-52]

Strategic Directions:

2.11 Investigate and implement means to enhance the collection, sharing, analysis, scope and distribution of data and information required to conserve biodiversity and sustainably use biological resources.

2.12 Promote the continuing development of information management systems such as Geographic Information Systems and other technologies that facilitate the rapid analysis and distribution of biological and biophysical data and information.

2.13 Work towards ensuring that data and information generated by publicly-funded studies are made available to potential users through appropriate sharing arrangements.

2.14 Participate in the development and maintenance of appropriate international data bases.

[Source: Canadian Biodiversity Strategy, 1995, p. 53]

Strategic Directions:

2.27 Develop and implement monitoring programs to:

a) better understand the functional linkages in ecosystems;

b) evaluate the success or failure of conservation and sustainable use policies and programs; and

c) better integrate the monitoring of biological and non-biological parameters.

2.28 Develop and use biodiversity indicators that are meaningful, scientifically defensible, practical and compatible with regional, provincial, territorial, national and international programs.

2.29 Identify appropriate locations to establish base monitoring sites.

2.30 Target monitoring programs on ecosystems, species and populations that are currently under the most stress.

2.31 Develop and implement measures to monitor the ex situ collection of biological resources.

2.32 Use volunteers in monitoring programs where appropriate and practical.

[Source: *Canadian Biodiversity Strategy*, 1995, p. 58]

6.2 Education and Awareness

6.2.1. Scope

The loss of biodiversity is a global problem requiring solutions based on individual and community participation and commitment. If national and international efforts to conserve biodiversity and use biological resources in a sustainable manner are to succeed, individuals and communities must understand and appreciate the value of biodiversity and the causes of its decline.

[Source: *Canadian Biodiversity Strategy*, 1995, p. 59]

Question 51: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Training

Ecological planning and management training programs, tailored to the needs of policy-makers and resource managers are required. Training will also help policy-makers understand the implications of policies and programs before they are implemented.

Scientific Training

Article 12:

a) Establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biodiversity and its components. .....Convention on Biological Diversity

[Source: *Canadian Biodiversity Strategy*, 1995, p. 56]

Before national and provincial efforts to conserve biodiversity can succeed people need to understand and appreciate the value of biodiversity, the causes of its decline and the actions necessary to maintain or restore its health. Goal Three recognizes that education is an effective means of changing public perspectives on biodiversity. We need to increase the effort and resources dedicated to environmental education so people are provided with an understanding of ecosystems and the social and economic implications of the loss of biodiversity. In addition, there is a need to target environmental literacy in key sectors of society including land and resource managers."

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, government of Saskatchewan, p.17]

The understanding and involvement of New Zealand communities in conserving and sustainably using biodiversity.

[Source: New Zealand Biodiversity Strategy Theme Eight - Community Participation and Awareness, p.1]

Unlike advocacy campaigns that tell people what to think, responsible biodiversity education must be concerned with helping learners to better understand their own values and to develop the processes and skills they need to think critically and to make their own well-informed decisions. In addition to being of and understanding issues, people must be able to identify their own values and be able to reason about moral issues. Learners should be given the skills to make future decisions for themselves rather than merely be persuaded or manipulated. Ultimately people need to be able to make their own moral decisions about environmental matters. The job of educators is to ensure that individuals have the tools necessary to make responsible environmental decisions. Critical to the success of biodiversity education is the commitment to meaningful participation.

[Source: Learning about Biodiversity, A First Look at the Theory and Practice of Biodiversity Education, Awareness and Training in Canada p. 6]

6.2.2 Challenges, Issues and Opportunities

Question 52: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

It has been demonstrated that education is the most cost-effective means of producing long-term social change. Education allows individuals to make lifestyle and consumption decisions that are sensitive to biodiversity conservation and sustainable use objectives.

Biodiversity education and community awareness should be strengthened in a variety of ways to reach people across the country. Biodiversity themes should be enhanced in the curricula of formal education systems, as well as in non-formal settings such as museums, zoos, aquariums, botanical gardens, nature centres and parks. Awareness-raising and education could also take place through such means as the mass media, films or interactive computer programs.

A significant portion of Canada's biodiversity exists on private land. Education programs developed for land-owners and local communities will need to be tailored to the needs of these vital audiences....

Members of the public possess valuable knowledge that can contribute significantly to government policies, plans and programs. Processes should be designed in such a way that full and meaningful public participation takes place.

[Source: Canadian Biodiversity Strategy, 1995, p. 59]

The Nature of the Challenge

There is much evidence to suggest that broad sectors of society have little knowledge of, or direct interaction with biodiversity or biodiversity issues. Many barriers prevent contact between people and biodiversity which the Strategy must address if it is to be successful. They include:

- projects that treat people as targets rather than as equal, participating partners
- poor integration of biodiversity into other policies or strategies
- perceived lack of relevance to people
- limited understanding of the added value of biodiversity educa-

tion

- ineffective communication between biodiversity professionals and educators

The ultimate success of this Strategy will depend on the extent to which it is accepted and implemented.

[Source: England Biodiversity Strategy, p. 88]

Summary of Issues

People are the fundamental agents of change; individually and collectively, their decisions and actions are crucial to the conservation and sustainable use of biodiversity. The success of this strategy depends on behavioral change and the active involvement of people and their organizations and communities in biodiversity management. This relies on people understanding and valuing biodiversity (how it contributes to ecosystem health as well as to their lifestyles) and being motivated to act and respond appropriately to biodiversity issues. Key issues relating to community awareness and involvement include:

- There is a general lack of understanding of the importance of biodiversity in sustaining life, the effects of human activities on biodiversity, how to prevent or reverse the current decline in biodiversity and how individuals can participate.
- There is a need to increase community participation in conserving biodiversity. The approaches taken by management agencies consulting with resources managers and communities and involving them in biodiversity management often vary and in some cases are inadequate.
- Many organizations are currently involved in a diverse range of environmental education initiatives, but programs and activities are not necessarily well coordinated, integrated or most effective, for example in relation to sharing information, integrating education activities and building partnerships.
- There is a need to recognize and mainstream biodiversity concepts in broader environmental education programs and to make biodiversity information relevant to people's local environments, that is, to enable people to connect biodiversity with their places and how it contributes to their lifestyles. An environmental education curriculum and resource material need to be developed and teachers trained in their application...

[Source: New Zealand Biodiversity Strategy, Theme Eight, p. 2]

6.2.3. Goals, Objectives, Strategies

Question 53: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

GOAL 3

To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner.

Article 13:

a) Promote understanding of the importance of, and the measures required for, the conservation of biodiversity.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 59]

Desired Outcome for 2020: New Zealanders have embraced a vision for conserving and sustainably using biodiversity. They have an enhanced and broader appreciation of New Zealand's biodiversity and better understand the indigenous

species, habitats and ecosystems associated with the places where they live – on farms, in and around towns and cities, and in the surrounding natural areas.

Children and adults are learning about biodiversity through schools, polytechnics and universities and community programs, and are actively involved in its care. People value biodiversity, know how they can contribute to its conservation and sustainable use, and are taking responsibility for action within their businesses, communities and lifestyles.

Individuals within management agencies, researches and professionals, private resource managers (and users) iwi and hapu and the wider community know and respect each other's roles in biodiversity management and are sharing their knowledge. Each group has sufficient information and capability and is activity incorporating biodiversity priorities in its management programs, businesses and day-to-day activities. All are involved in, and contributing in some way, towards the achievement of New Zealand's biodiversity goals.

[Source: New Zealand Biodiversity Strategy, Theme Eight, p.1]

Vision: A society in which people recognize, value and take action to maintain and enhance biodiversity as part of their everyday lives – in the same way that they might address health issues, the community in which they live, or their economic circumstances

[Source: England Biodiversity Strategy, p. 87]

6.2.4. Strategic Actions

Strategic Directions:

3.1 Develop and deliver effective biodiversity education and awareness programs by:

a) evaluating and monitoring the level of public understanding and knowledge regarding biodiversity conservation and the sustainable use of biological resources in order to design and target effective education and awareness programs;

b) integrating themes and messages about biodiversity conservation and the sustainable use of biological resources into the formal educational curriculum;

c) increasing biodiversity conservation and the sustainable use of biological resources messages by building on existing interpretive programs in national and provincial parks and other protected areas, and at libraries, museums, zoos, aquariums and botanical gardens; and

d) strengthening coordination among educational institutions, government departments, museums, zoos, aquariums, botanical gardens, businesses, conservation groups and other organizations.

3.2 Enhance opportunities for professional development for those involved in teaching environmental education.

3.3 Create educational material that emphasizes measures that can be taken to prevent or reduce impacts on ecosystems and biological resources.

3.4 Promote public awareness of biodiversity issues, conservation and sustainable use requirements and changes in the state of biodiversity and improvements in resource management practices through periodic reports, fact sheets, electronic information systems and other communication material and methods.

[Source: Canadian Biodiversity Strategy, 1995, p. 60]

Question 54: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

Action plan:

Objective 8.1 Community awareness and involvement:

Enhance and broaden individual and community understanding about biodiversity (in particular, New Zealand's indigenous biodiversity) and increase community involvement in the conservation and sustainable use of New Zealand's biodiversity.

Actions:

a) Make information about biodiversity available to people and communities, relevant to their local environments (that is, on the extent and management needs of ecosystems, habitats and native species), to enable them to make decisions and take action to support the conservation and sustainable use of biodiversity. c) Encourage greater community involvement and partnerships in management programs and participatory projects to conserve and sustainably use biodiversity.

Objective 8.3 Environmental education:

Expand and enhance education about biodiversity as a key element in developing environmental education programs and activities.

Actions:

a) Integrate biodiversity considerations into the implementation of the National Strategy for Environmental Education, including the development of environmental education curriculum guidelines for schools, the establishment of an in-service training program for teachers and guidance for local authorities.

[Source: New Zealand Biodiversity Strategy, Theme Eight, p. 3]

6.3 Incentives and Legislation

6.3.1. Scope

Question 55: What do you recommend be the scope (i.e. the bounds) of the discussion for this topic in the proposed Ontario Biodiversity Strategy?

Incentives

Canadian society has not recognized the value of ecological services, species and genetic resources. Often, environmental conservation has been seen as a cost to society, rather than an investment in the future, and the benefits of conservation, especially biodiversity conservation, have been improperly understood. As a result, economic decision-making has not adequately reflected the value of biodiversity. However, there is now growing recognition that the ecological systems that support human society are under severe pressure, and that economic activities must be pursued in harmony with the Earth's capacity to support them.

[Source: Canadian Biodiversity Strategy, 1995, p. 61]

Legislation

Legislation is an important tool that can contribute to achieving the conservation of biodiversity and the sustainable use of biological resources. Legislation is most effective when it is developed and used as part of an overall strategy that includes planning systems, education and incentives.

[Source: Canadian Biodiversity Strategy, 1995, p. 62]

One of the challenges facing society today is balancing the desire for prosperity through development with the need to conserve the environment in a way that is fair to everyone, other species and for future generations.

Because the benefits of biodiversity conservation are not well understood, environmental conservation has often been seen as a cost to society rather than an investment in the future. At the same time, it is becoming evident that setting aside small isolated islands of natural ecosystems as protected areas is not enough to maintain ecological function across the broader landscape. Goal Four reflects the need for government decision-making, including legislation and regulations, to recognize the value of biodiversity as "natural capital".

Additionally, Goal Four addresses how economic instruments, or incentives, can be used to influence conservation activities throughout Saskatchewan. The focus is to assess a variety of incentives that would allow society to assist the agricultural community in conservation efforts that have broader environmental benefits.

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, government of Saskatchewan, p.19]

6.3.2 Challenges, Issues and Opportunities

Question 56: What are the major challenges, issues and/or opportunities regarding the conservation of biodiversity and/or the sustainable use of biological resources that you recommend the Strategy identify and discuss in this topic area?

Government and international policies have influenced, and will continue to influence, the conservation of biodiversity and the sustainable use of biological resources. These policies have affected corporate behaviour in major resource sectors, including fisheries, forestry and agriculture and in the development of non-renewable resources. If the objectives of the Convention are to be achieved, federal, provincial, territorial, regional and urban government policies will need to be supportive of biodiversity conservation and the sustainable use of biological resources.

Economic instruments should be developed to influence consumer behaviour in ways that support biodiversity conservation and the sustainable use of biological resources. Individuals and families make daily decisions based on the costs of goods and services. Economic instruments have successfully been used to change consumer spending in many areas. For example, water consumption has been significantly reduced in some urban areas by charging consumers for the volume of water they use, rather than charging a flat fee. Consumers have also shown some willingness to pay more for products they believe are environmentally friendly. Economic instruments such as "green taxes" have been used to influence consumer behaviour. Deposits on containers have been successful in promoting recycling, and debt-for-nature swaps have been effective in establishing protected areas in some countries.

[Source: Canadian Biodiversity Strategy, 1995, p. 61]

Legislation regarding biodiversity is administered by the various orders of government. Implementing the Convention does not require changing the constitutional division of powers in Canada. However, governments are prepared to examine current administrative arrangements with a view to ensuring that administrative efficiency and effectiveness are optimized.

[Source: Canadian Biodiversity Strategy, 1995, p. 62]

6.3.3. Goals, Objectives, Strategies

Question 57: What goals/objectives/strategies do you recommend that the Strategy identify in this topic area for Ontarians to work/strive towards?

Economic and Social Incentives

Article 11:

Adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biodiversity.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 61]

National Decision-making

Article 6:

Develop national strategies, plans or programmes for the conservation and sustainable use of biodiversity, or adapt for this purpose existing strategies, plans or programmes.....Convention on Biological Diversity

[Source: Canadian Biodiversity Strategy, 1995, p. 63]

Objective 13

Economic Instruments:

Develop economic instruments to support biodiversity conservation and the sustainable use of biological resources.

Objective 14

Policy and Legislation Review:

Review policy and legislation with respect to biodiversity and sustainable use of biological resources in light of threats to biodiversity including climate change."

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, government of Saskatchewan, p. 20]

6.3.4. Strategic Actions

Strategic Directions:

4.1 Maintain or develop and use appropriate social/economic policies and incentives as a means of promoting the conservation of biodiversity, the sustainable use of biological resources and new sustainable uses of biological resources.

4.2 Enhance our capability to assign a value to biodiversity, and increase efforts to construct a natural resources account that considers ecosystem degradation, loss of species and genetic diversity and resource depletion, and complements standard national income accounts.

4.3 Investigate the impact of proposed biodiversity conservation policies and programs on economic activities in order to develop effective conservation measures that enhance positive impacts and minimize negative impacts on the economy.

4.4 Determine and make available to policy-makers the estimated costs associated with unsustainable use of biological resources, including the costs of ecosystem degradation and the depletion of species and populations.

4.5 Ensure that economic, trade, conservation and sustainable resource-use laws and policies are mutually supportive.

4.6 Encourage the participation of property owners and resource developers in biodiversity conservation programs.

4.7 Jurisdictions will examine their current legislative regimes with respect to the goals of this Strategy, and take the necessary and practical steps towards creating an improved legislative framework that supports the conservation of biodiversity and the sustainable use of biological resources.

4.8 Jurisdictions will determine whether harmonization among Canadian jurisdictions and other countries of biodiversity-related legislation is necessary to reduce duplication and fill gaps and work towards harmonization where appropriate and practical.

[Source: Canadian Biodiversity Strategy, 1995, p. 62]

13.1 Assess a variety of economic incentives specifically aimed at the conservation of biodiversity and ecological function and recommend specific instruments:

Question 58: What actions do you recommend that the Strategy identify for Ontarians in this topic area to focus their efforts on, and especially what should the focus of actions be over the next five years?

Ongoing

13.2 Work with the federal government, the agriculture sector, and/or other stakeholders to implement the environmental stewardship component of the national Agricultural Policy Framework. This will entail the following initiatives:

- Encourage the conversion of marginal cultivated lands to perennial vegetation cover (grasses, legumes, trees, shrubs) to enhance or protect important upland and riparian habitat areas: 2005
- Complete a provincial environmental scan to identify priority issues and regions requiring corrective action: 2005
- The implementation of a voluntary Environmental Farm Plan Program with widespread participation in the completion of individual and group environmental plans: 2008
- Begin implementation of environmental farm plans through the adoption of environmentally beneficial practices: 2005

14.1 The Saskatchewan Government will ensure that environmental issues are considered when departments conduct a review of existing policy and legislation and in the development of new government policy and legislation: Ongoing"

[Source: "Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future 2004-2009, government of Saskatchewan, p. 20]

1.5.1 Incentives for conservation

Ensure that adequate, efficient and cost effective incentives exist to conserve biological diversity. These would include the use of appropriate market instruments and appropriate economic adjustments for owners and managers, such as fair adjustment measures for those whose property rights are affected when areas of significance to biological diversity are protected. Priority should be given to:

a. areas important for migratory species, threatened indigenous species, remnant vegetation, wetlands and corridors between protected areas;

b. maintaining environmental conditions, including associated flora and fauna, for the conservation of microbial diversity;

c. establishing voluntary wildlife refuges and negotiating conservation covenants and heritage agreements between owners and managers and governments, and providing sufficient resources, including trained facilitators, on an area or regional basis to assist in the implementation phase.

[Source: National Strategy for the Conservation of Australia's Biological Diversity, Op. cit. page 6 of 11]

7.0 Implementation

The Canadian Biodiversity Strategy is a key building block in our efforts to achieve sustainable development. Ultimately, the degree to which the Strategy is able to enhance our national capacity to conserve biodiversity and achieve sustainable development will be the measure of its success. Specifically, we will know that the Strategy is making a difference if:

- the value and importance of biodiversity is reflected in the actions and decisions of all sectors of society, from corporations to individual consumers, private property owners, and various orders of government;

Question 59: What subjects would you recommend be included in an implementation section of the proposed Strategy?

- we are capturing existing information, generating new knowledge about biological resources and conveying that knowledge in a useful, timely and efficient way;
- we are no longer planning and making decisions based exclusively on a species-by-species or sector-by-sector basis, but are practising ecological management;
- opportunities are being created through technological innovation, application of traditional knowledge, scientific discoveries and new applications of sustainable use; and
- we are maintaining biodiversity for future generations and contributing to conservation and sustainable use efforts worldwide through financial assistance, knowledge, expertise and exchange of genetic resources.

The capacity to determine how biodiversity is managed is not limited to governments. Local and indigenous communities, businesses and industries, conservation groups, research and educational institutions, and individuals must be involved in the implementation of the Strategy. Success will require a coordinated approach based on cross-sectoral cooperation and partnerships among all orders of government, non-government organizations, private sector interests and individuals.

Numerous policies, plans and programs have been developed in Canada to enhance the conservation of biodiversity and to achieve the sustainable use of biological resources. Jurisdictions have developed conservation and sustainable development strategies and policy statements regarding the conservation of wetlands and other aquatic ecosystems, wildlife, fisheries, forest and agricultural resources, and protected areas.

Conservation and sustainable development strategies, sectoral policies and programs, and regional plans, Round Tables on the Environment and Economy, land claim settlement agreements, and many other mechanisms can be immediately used to help implement the Strategy. Mechanisms to more specifically address the provisions of this Strategy will be brought on stream according to the policies, priorities, constraints and needs of each jurisdiction.

Given the broad scope of the Strategy, it will be necessary to set priorities for action. Priority setting will require evaluating the costs of inaction as well as the costs of taking proposed actions.

To ensure effective and coordinated implementation of the Canadian Biodiversity Strategy in accordance with each jurisdiction's priorities and fiscal capabilities, federal, provincial and territorial governments will:

6.1 Strengthen linkages at the Ministerial level to oversee the implementation and monitoring of the Canadian Biodiversity Strategy.

6.2 Report within one year after the Ministerial endorsement of the Canadian Biodiversity Strategy on policies, programs, strategies and actions that are underway or will be undertaken to implement the Strategy, and subsequently report publicly on progress in implementing the Canadian Biodiversity Strategy at a frequency to be determined.

6.3 Within each jurisdiction, maintain or develop mechanisms to provide opportunities for meaningful participation of regional and urban governments, local and indigenous communities, interested individuals and groups, business interests, and the scientific community in implementing the Strategy.

6.4 Coordinate elements of the Strategy that require national participation in order to help develop international positions on biodiversity matters and oversee the development of national and international

progress reports.

6.5 Ensure that there are mechanisms in place that permit and encourage non-government organizations and members of the public to participate in the implementation of the Strategy and the development of international biodiversity agreements.

6.6 Report periodically to Canadians and the international community on the status of Canada's biodiversity.

6.7 Challenge and invite all Canadians to contribute toward achieving the goals of the Strategy and take action to conserve biodiversity and to use biological resources in a sustainable manner.

6.8 Explore mechanisms to provide opportunities for participation of indigenous communities in implementing the Strategy through a variety of mechanisms such as resource management agreements, management boards, model forest programs and other means.

Indigenous Community Implementation

For thousands of years prior to the arrival of Europeans, indigenous people depended on the land and its natural resources to meet their physical, social, cultural and spiritual needs. Many indigenous communities continue to have an intimate cultural relationship with the land and its resources. Individuals in these communities possess a range of expertise that could significantly contribute to the conservation of biodiversity and the sustainable use of biological resources.

The existing aboriginal and treaty rights of the indigenous people of Canada are recognized and affirmed in the Constitution and by decisions of the Supreme Court. Agreements between governments and aboriginal authorities have led to the creation of cooperative management regimes for wildlife. Indigenous people have certain management authorities relating to the use of settlement and reserve lands and management of the resources on those lands. Through negotiated cooperative agreements, indigenous communities are assuming increased responsibility for the management of biological resources.

In 1987, the report of the World Commission on Environment and Development highlighted the importance of preserving the traditional knowledge and experience that exists within indigenous communities. The report stated that the loss of traditional knowledge and skills in sustainably managing complex ecosystems would be a loss to society. The Convention on Biological Diversity reinforces the need to respect, preserve and maintain the knowledge, innovations and practices of indigenous communities that relate to the conservation and sustainable use of biodiversity.

[Source: Canadian Biodiversity Strategy, 1995, p. 64-65]

Protecting Traditional Practices

Article 10:

c) Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation and sustainable use requirements.....Convention on Biological Diversity

Indigenous response to the Convention must be community-based and community-paced. This will require formulating local systems for preserving, using and regenerating traditional indigenous knowledge.

Strategic Directions

7.1 Indigenous communities develop an approach to implementing the Convention with a view to reflecting distinct indigenous values, social networks,

traditional economies and cultures by:

a) building on the current networking process of meetings, workshops and other consultation methods that enable indigenous communities to determine how they will contribute to the implementation of the Biodiversity Convention;

b) demonstrating the role of indigenous knowledge and management in the conservation and sustainable use of biodiversity, and establishing opportunities for indigenous communities to share their knowledge of biodiversity and the management of biological resources with non-indigenous communities;

c) leading the development of community-based regimes designed to preserve traditional indigenous knowledge, innovations and practices and recognizing their potential economic, scientific, social and cultural values;

d) establishing linkages with federal, provincial and territorial agencies responsible for implementing the Convention; and

e) facilitating the maintenance of indigenous social and cultural traditions that support the communication of traditional knowledge and resource use methods among generations and communities.

7.2 Encourage the development of an indigenous community analysis of the Convention with reference to "knowledge, innovations and practices of indigenous communities" by taking into account issues of intellectual property rights and the use of genetic resources. This analysis should emphasize ways in which knowledge and practices are applied in biodiversity conservation and examine how innovations can be protected by intellectual property rights.

7.3 Examine ways in which indigenous groups can share their knowledge and experience, and develop joint programs with indigenous groups inside and outside Canada.

[Source: Canadian Biodiversity Strategy, 1995, pp. 70-71]

Voluntary activities are clearly helping to make a difference in habitat protection, recovery of species, and preservation of biodiversity

What is Stewardship?

Stewardship refers to the wide range of voluntary actions that Canadians take to care for the environment, ranging from conserving wild species and their habitats directly, to improving the quality of habitat by mitigating human impact. These types of conservation activities, particularly those that protect habitat, are essential to the recovery of species at risk. They are also instrumental in preventing other species from becoming at risk.

Partnerships are the key to making stewardship a successful conservation tool in Canada. Federal and provincial governments encourage action by providing scientific information, technical assistance, and economic incentives. Non-governmental organizations help private landowners and concerned citizens identify and implement effective stewardship activities. Many other partners are also involved, including resource users, fishers, Aboriginal organizations, educational institutions, and community organizations.

[Source: Habitat Stewardship Program, EC, www.cws-scf.ec.gc.ca/hsp-pih/about_e.cfm]

The Stewardship Vision

The vision of Canada's Stewardship Agenda is "A nation where Canadians are ac-

tively working together to sustain our natural life-support systems." This reflects the fact that Canadians are already carrying out efforts to ensure the long-term health of these systems and, in turn, the resources these systems provide for the health and well-being of themselves, their children and their neighbours.

The scope of the Agenda reflects this vision, promotes collaborative action, and builds social cohesion and shared responsibility among citizens. In particular, it engages those who are involved in the conservation of biodiversity, the sustainable use of Canada's biological resources and the wise management of all natural resources. Under the Agenda, stewardship activities can be directed at the recovery of species at risk and contribute to the sustainability of terrestrial and aquatic ecosystems.

Priority Actions for Stewardship

The goals and objectives outlined in this Agenda provide a framework for strengthening and encouraging stewardship across Canada. However, practical steps are required to advance this framework in close collaboration with Canadians. The four actions described here focus on strengthening the network of stewards in Canada, empowering and expanding this network through the Internet-based Stewardship Canada Portal, and challenging this network to refine and improve Canada's Stewardship Agenda.

Action 1: Promote improved cooperation among stewardship programs and, where possible, coordination with conservation and sustainable use initiatives.

- Establish working agreements and partnerships, as appropriate, that will strengthen integration and collaboration among government and non-government stewardship programs.
- Collaborate on mechanisms and indicators that will improve monitoring and reporting on the impact of stewardship policies and programs, with a focus on making accountability easier, strengthening abilities to attract funding and reducing administrative costs.

Action 2: Establish a Stewardship Network to facilitate collaboration among stewards and help guide the implementation of Canada's Stewardship Agenda.

- Promote public involvement in stewardship
- Integrate and enhance incentives for those who implement stewardship.
- Enable stewards to identify their priorities for knowledge development and delivery, and support young people and stewardship advocates – especially those at the community level and in educational programs – to be local leaders in building collaboration, bringing people together to advance stewardship.
- Enable all stewardship groups and stewardship funding organizations to identify themselves, their stewardship programs and their achievements – through a Stewardship Network and on the Stewardship Canada Portal.

Action 3: Continue to develop and enhance the Stewardship Canada Portal.

Foster better collaboration among funding organizations to streamline applications, project management and accountability processes.

Encourage access to and use of guidelines and codes of conduct that promote "best management practices" for land management and sustainable use of resources.

Provide national policy forums that will enable individual stewards and organizations to influence the future of stewardship by commenting on planned or existing policies and legislation concerning stewardship and on the need for and progress toward fostering new knowledge.

Action 4: Explore the development of a Stewardship Charter to engage Canadians.

Source: Canada's Stewardship Agenda: Naturally Connecting Canadians A Federal-Provincial-Territorial Initiative (2002), http://www.stewardshipcanada.ca/sc_national/main/index.asp?sProv=ca

Question 60: Are there other topics that were not included in this first workbook that you recommend be addressed in the proposed Ontario Biodiversity Strategy? If so, please provide any initial advice on: scope; major challenges, issues and/or opportunities; goals/objectives/strategies; and actions?

Question 61: Do you have any other comments or suggestions?

Thank you very much for taking time to provide us with your suggestions. Your advice will assist us in developing the proposed Ontario Biodiversity Strategy.

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